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***The Internationalisation of an Agri-food Cluster:  
a Case Study***

Paola Bertolini\* [bertolini@unimo.it](mailto:bertolini@unimo.it)  
Enrico Giovannetti\* [giovannetti@unimo.it](mailto:giovannetti@unimo.it)

\* Dipartimento di Economia Politica  
Università degli Studi di Modena e Reggio Emilia  
Via Berengario 51  
41100 Modena  
Italy

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Paola Bertolini\* [bertolini@unimo.it](mailto:bertolini@unimo.it)  
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\* Dipartimento di Economia Politica  
Università degli Studi di Modena e Reggio Emilia

**1. Introduction**

The paper is an exploration of the relationships between the local and international dimensions of an important agri-food cluster: the meat (pork) processing industry, in Modena, a province of Northern Italy in the “Food Valley”, located in a typical “district area”. The cluster comprises a dense network of small and medium enterprises, which have developed in adjoining areas, creating a cluster organised around specialisation in the different stages of production.

Its characteristics have made the activity one of the first food industry cases to be studied using the district approach. Surveys in the field have examined the business's structural features, confirming characteristics similar to those of the other industrial districts (Brigo *et. al.*, 1992). Subsequent further studies revealed two key factors: the first concerns the relations between the local and international dimensions of production and markets (Bertolini *et. al.* 1998); the second regards the analysis of relations with other local food industries, and especially those focusing on products with geographical quality marks (PDO, PGI, TSG, etc.) (Bertolini 2003). This revealed the importance of the international markets for the district's economy, especially for the supply of raw material.

On the pages which follow, we intend to take a closer look of the evolution of the business's organisational structure, bearing in mind its main determinants: we aim to examine whether and how the changes brought about by globalisation have affected the organisation of the district's business and its relationships with its context.

The paper wishes to put forward the hypothesis that the cluster has been, and is still, an engine of the globalisation process. The cluster as a whole is therefore considered as a complex economic player, capable of generating coherent action, regulated by institutional mechanisms, and founded on a set of "public assets" which make up its “social capital”. These features underline the existence

of a specific unit of analysis, indivisible from the "individuals" which constitute it.

Although the district concept will be used, we are not particularly interested - for the time being at least - in the choice of a label (agglomeration, complex, pole, supply chain, district, social-network, etc.). Attention will be focused on the "Institutional Structure of Production" (Coase 1992) which guides the way in which firms in the area operate. In other words, we wish to demonstrate that the grouping, defined by the institutions which characterise it, is capable of action in its own right. We thus contest the idea of a cluster as a "formation" which, like a stalagmite, is produced by "drips" from external economies and/or other market imperfections and failures and, sooner or later, is thus destined to crumble.

The case study is an excellent natural laboratory for discussing these positions: the cluster does not derive from existing large firms; it is located in an area with other networks evolving in different ways and with different degrees of integration; it competes for use of the labour and environmental resources. The analysis will attempt to show an economically lively, institutionally oriented entity: the specific organisational culture, the style of negotiation between economic agents, the use of human and environmental resources, and the demand for economic policy are coherent with the survival and growth of the grouping itself. As the characteristics we will be highlighting reveal, the cluster is not only fully inserted in the context of globalisation, but is actively fuelling the growth of this phenomenon.

Three sources are used: the first is the Chamber of Commerce (CCIAA) archives, in order to reconstruct the firms' general characteristics and compare them with the previous surveys. The second source is the data of the Veterinary Information Service ("Sisvet"), for detailed analysis of the different categories of activity involved, and their evolution during the time. The third source involved the direct collection of materials from firms themselves, both by consulting their archives and through interviews with managers.

## ***2. The theoretical framework and the working hypotheses***

In the following analysis of the cluster's growth and internationalisation, the main assumption is that the aggregation as whole can be approached using the same method utilized for an individual firm. According to the methodological guidelines drawn up by Coase ([1937] 1991), if a firm's nature lies in the benefits (and limitations) of the integration of factors and processes, it seems to

be perfectly logical to consider more complex aggregations governed by similar mechanisms:

“[The] economic system is extremely complicated. You have large firms and small firms, differentiated firms and narrowly specialised firms, vertically integrated firms and those single-stage firms; you have in addition non-profit organisations and government entities – and all bound together, all operating to form the total system. But how one part impinges on the others, how they are interrelated, how it actually works – that is *not* what the people study. What is wrong is the failure to look at system as object of study. ... I think the key to the development of a sensible analysis is the comparison between the additional production resulting from the rearrangement of activities and the cost of the transactions needed to bring the rearrangement about. ... However, the transaction costs depend ... on the working of legal system. They also depend on the political system, they depend on the educational system, and they are interrelated with others social systems.” (Coase 2002, p. 3)

The search for analytical units, other than the firm, is a clear feature of the lines of study of many researchers, who opened the way to Italian investigation of industrial districts (Becattini 1979, 1987; Brusco 1975, 1989; Tani 1976). It is no coincidence that their works started from criticism of models of "imperfect competition", and moved on to study the concept of "indivisibility" and the nature of economies of scale; in this tradition, "empirical works which actually change the way we look at the problem" (Coase 2002, p. 2) become extremely important. With regard to Coase's insistence that a new approach is needed, the state of the debate is more encouraging than the elderly Nobel prize-winner's words suggest. We must remember the models of system evolution "Out of Equilibrium" (Nelson *et al.* 1982; Amendola *et al.* 1998), the "competency based" models (Foss 1997; Hodgson 1999; Langlois *et al.* 1999; Pitelis *et al.* 1999), and the research into complexity (Lane 2002; Quadrio Curzio 2002). Moreover, a significant part of the literature and empirical research about clusters is moving exactly in the direction recommended by Coase (Helmsing 2001).

This work is guided by the research tradition outlined above. The case study we will be analysing suggests a methodology for studying the "nature" of aggregations, in order to evaluate the way they function as a whole, and measure the "internal" against the "external" advantages; the methodology allows us to explain the reasons for success against the external competition. We can also provide a brief outline specifying the different methodological approaches, as follows:

- Technical conditions and automatic formation of incentives (economies of scale) *vs.* organisation of resources and distribution rules;

- Imperfect competition vs. internal innovation;
- externality vs. institutional action;
- (micro)economic policy as a correction of the market's failure vs. economic policy which defines the reproduction of resources and public goods.

### 2.1. *Economies of scale, externalities and unit of analysis*

Moving away from the Neo-classical approach, there is a broad convergence of various branches of research moving along the lines Coase considers so important. The key points of an approach which gives appropriate consideration to "complexity" can be summarised as follows (Lane 2002; p. 69):

- process and change
- multilevel organization of entities
- entity function determined by entity structure
- distributed control and information-processing
- emergence and self-organisation

The cluster concept appears to be a cross-roads at which a number of research paths meet: the tradition of Marshallian studies, the "new economic geography", and the research activity focusing on "social capital" (Serravalli *et al* 2002). In this field, all works have to deal with the interpretation and re-reading of the two key concepts of "economies of scale" and "externality". These concepts turn out to be catalysts, capable of sparking debate on all the fundamental points of a complex view of the economy.

For example, the reasoning on which the new "economy of space" is based, starts from the proposition that "*activities tend to cluster where the markets are large and the markets became larger there where activities cluster*" (Krugman 1995). The proposition is congruent with the Smithian assertion that the division of labour is limited by the size of the market: as we are all aware, this statement is ambiguous in its formulation and outcome (Stigler, 1951; Leijonhufvud, 1986). To paraphrase Stigler: either firms compete –and continue to compete– because demand is large; or they "concentrate", capturing increasing market shares, but for reasons other than the *initial* reasons relating to the volume of demand.

On this head, empirical work is able to give extremely precise information: if we look back to 1948 – the year of foundation of the firm which was to become Italy's largest firm in the sector studied – we cannot suppose there was any particular "concentration" of demand in the area, considered capable of explaining the firm's outstanding performance in the years which followed: consumption of salami has always united the regions of Italy, and these regions

to the rest of Europe, much more firmly than the Wars of Reunification or the Maastrich Treaty.

The analytical point is not the different initial size of the demand; the problem is to explain why the division of labour between firms takes place within a limited geographical area, and why this occurrence is significant for the achievement of economies of scale.

Naturally, it could be argued that economies of scale refer only to "firms" and their spatial contiguity (lower freight costs, wide labour market, shared services and infrastructures). In other words, economies which are "external" to the firm but internal to the cluster, but not the cluster itself, as an independent unit of analysis. However, this approach does not explain the reproduction over time of a small enterprise system, which is one of most important themes of the research on clusters. Moreover, on the theoretical plane, this approach repropose all the contradiction of the original Marshallian approach. The literature on districts, at least in the Italian research tradition, springs from the empirical analysis on the duration and role of the small enterprise (Brusco 1975) and has already taken on board the criticism of Marshall and the "imperfect competition" methodological approach (Becattini 1962)<sup>1</sup>.

As we have underlined, many differences in interpretation arise from a lack of clarity concerning the units of analysis, deriving from the conscious, or unconscious, refusal to assign theoretical dignity to aggregate entities which do not fit into the model of perfect competition. Concerning this debate, we repropose as an important step the analysis of the "integration/divisibility" of processes.<sup>2</sup> In this perspective, we assume that the divisibility of processes is closely linked to the rules of distribution, and in turn determines the structure of transaction costs, in the sense of the costs of the social division of labour (Coase 1998; Negishi 2000; Giovannetti 2001).<sup>3</sup>

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<sup>1</sup> It is interesting to remember the criticisms made by Becattini against J.Robinson on the concept of the "sector" (Becattini 1962), which nature is the same that guides the methodology of Coase's famous work (Coase 1937; 1992).

<sup>2</sup> It is important to remember the theoretical impact of the work of Georgescu-Roegen (1971), presented in a cycle of seminars at Florence University in the early '70s, and the trigger for the "Funds and Flows" production model (Tani 1976). The paper here presented is directly inspired by these theoretical lines; for formal outlines of the theory, readers can refer to previous authors (Morrone 1992; Petrocchi Zedde 1992; Tani 1986).

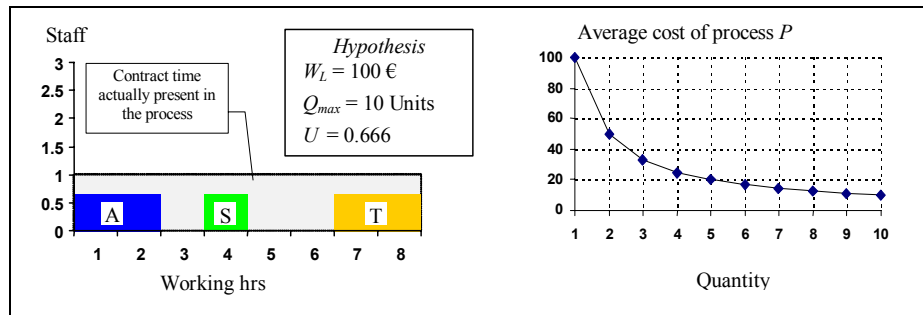
<sup>3</sup> It is worth nothing that, yet in "The Nature of the Firm", when delineating the firm's borders, the ratio between organisation costs and market costs are illustrated as "geographical" representation of the *social* division of labour (Coase 1937; 1992, p.28).

## 2.2. Economies of scale: a model for the analysis

We would now like to provide an initial approach to interpreting economies of scale, by attempting to demonstrate their organisational, rather than technological, nature. This is an important issue because it reverses the logic by which internal allocational decisions depend on the impact of external variables (technologies, market constraints, availability of factors, etc).

Let us imagine the production process  $P$  containing the technical stages for the production of salami (Fig. 1). Let us also imagine that the production organisation is indivisible because this is economically more acceptable (more rational, less risky, more competitive and/or more compatible with the institutional context); it will correspond to the executive plan illustrated in Fig. 1.

Fig. 1 – Organisation and costs in an elementary process  $P$



The diagram illustrates the use of the labour in the three main stages of the cycle: slaughtering (A), sectioning (S) and transformation (T). It also indicates the technical wait-times necessary for further additional "external" processes (transport, curing, health inspections, etc.); the right-hand side illustrates the trend in the average costs of the process  $P$ . The model assumes a fixed ratio between factors within the limits of the process (time and operations performed).<sup>4</sup> Therefore  $P_1$  and  $P_2$  will be two congruent, indivisible production processes for combination. Thus, given that:

$$(a) \quad C(P_1) + C(P_2) = C(P_1 + P_2);$$

an integration procedure will be economically advantageous if, and only if:

<sup>4</sup> The model also imagine a "mean" under-utilisation of the labour factor (0.66), which may derive either from "non specialisation" or from cautious planning of the production capacity. The hypothesis illustrates the model's flexibility in relation to the degree of realism aimed at, but it can be abandoned without negative effects. Finally, it should be remembered that the model does not pre-suppose a fixed coefficient production function (Giovannetti 2001).

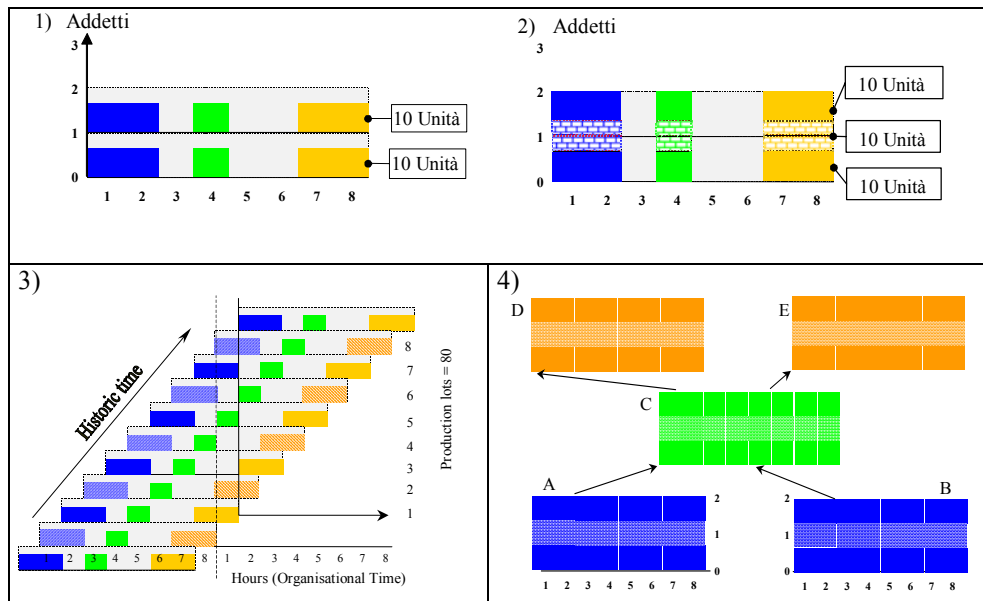
$$(b) \quad C(P_1) + C(P_2) > C(P_1 \oplus P_2)$$

where the symbol  $\oplus$  indicates the presence of economies of integration (scale and/or scope).

The demonstration of (a) becomes clear if we observe part 1) of the diagram in Fig. 2 and the trend in the series of costs relating to the organisation in "sequence" in Fig. 3. Since they are separate, the two processes have the same costs as in Fig. 1: it does not matter whether they are carried out in two separate production units or in the same building.

Also in stylised form, we will now examine three possible models of integration  $\oplus$  (Fig. 2): in parallel (2), in line (3) and in line-parallel (4).

Fig. 2 – Models for integration of the elementary process: sequence (1), parallel (2), line (3) line-parallel (4)



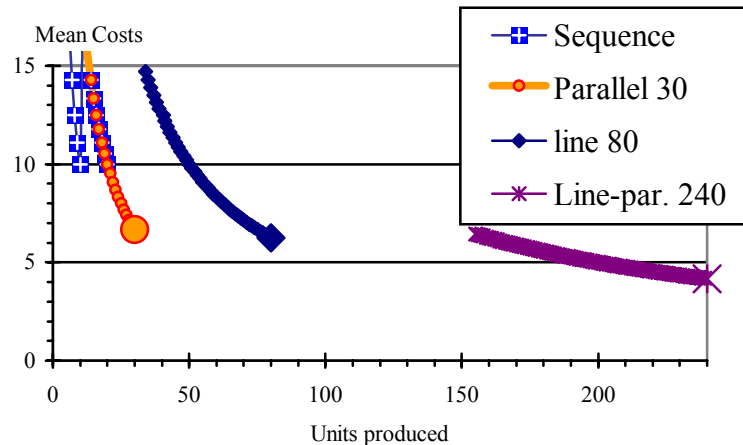
Model (2) illustrates direct co-operation between workers: e.g., two workers who help each other with heavy jobs, synchronise the performance of their respective tasks in real time, alternate their breaks, swap tools and information, etc.. Part 2) of Fig. 2 summarises this situation, where simple co-operation may increase the intensity of use per hour worked from 0.66 to 1, for both workers; this allows the activation of a new process, without using additional workers. The result will be 30 lots of final product.

Model (3) illustrates integration in line. This occurs in accordance with the Smithian principle of specialisation: by contract agreement, the workers constantly perform the same task for eight



working hours a day. The organisational model is shown in part 3) of Fig. 2. Two workers work continuously on the first task, slaughtering, represented by the black (and black striped) area; together, they generate a product flow which takes up all the eight hours of the worker employed on the dark grey area (sectioning). Finally, the flow of "processed pork" product is finished as salami by the two workers employed on the tasks of the grey (and grey striped) area. This means that during the working day, every hour, for eight hours a day, 10 production lots will be produced, since all the stages necessary for the final product are present simultaneously during any given one-hour period (the two vertical lines). The maximum output which can be achieved during the day will amount to 80 lots.

Fig. 3 – Mean costs of the different types of organisation



Last but not least, model (4), the most useful for our purposes, supposes that the processes are activated on the basis of the line-parallel organisational plan, in which co-operation, specialisation and full use of the productive capacity of the labour are achieved in the various work "stations" A, B, C, D and E. In each station the workers co-operate and are fully employed; at the same time, the various stations are numerous enough to ensure that the product flow from one stage to the next is constantly synchronised. In this case, the maximum output the system is able to achieve will amount to 240 lots. The effects on costs are illustrated in Fig. 3. It is important to note that the symbol  $\oplus$ , in (b), is a stylised representation of an organisational action; this always complies with the constraints imposed by the indivisibility of the basic process, i.e. the complex of structural, technical and *institutional/contractual* constraints grouped together in the concept of "technical conditions". In spite of this, the various organisational models generate

increases in productivity highlighted by the relative position of the cost curves in Fig. 3: here, the "economies of scale" produced by the specific organisational model can be observed.

To conclude, it must be noted that the economies of scale are *not* described by the shape and trend of the individual curves, but by their relative positions; the trend of each curve simply illustrates the degree of use of production capacity, given the potential production level for which the process has been designed.

As the graphs show, the economies (of scale or scope) derive from specific features of the division of labour, linked to the way in which the working time and actual production activity of unit  $P_1$  is synchronised with the activity of units  $P_2...P_n$ . The economic advantage of process integration originates from the organisation; therefore, the advantage is *internal* to the new, aggregate unit of analysis, which is "indivisible" regardless of the distribution of rights, and logically previous to the definition and development of a technology (Georgescu-Roegen 1971, pp. 248-249). Moreover, it is independent from the opportunism of the economic agents or from other hypotheses concerning any market imperfections.

The diagrams illustrate the relationship between organisation and costs. By simply changing the co-ordination of the same tasks within the same processes, organisational actions are able to reduce costs more than in proportion to the increase in the quantity produced. The sequence of curves provides a picture of the scale/scope effects of the organisational changes; in other words, the effects which have been defined as *management returns* (Coase 1937). It is important to repeat, once again, that the mechanisms described are internal to the cluster and can be implemented regardless of the level of demand; they are a function of the transaction costs with which the organisation makes "*the comparison between the additional production resulting from the rearrangement of activities and the cost of the transactions needed to bring the rearrangement about*" (Coase 2002, p. 3).

In general, it can be seen that the organisational changes, which increase both specialisation and volumes, also allow the separation of the stages, and thus the number of observable transactions/markets. The causal relationship linking integration with the frequency of transactions also appears to be overturned: it is the degree of integration which is the independent variable, and not the number of transactions.

In the case under investigation, this feature is very clear. For example, the possibility of choice between subordination, autonomy or co-operation, in long-term relations, is open in all directions, leaving players free to "internalise" any external advantages through contracting: in spite of this, co-operative relationships be-

tween the independent players, the firms themselves, and other partners are fundamental. This consideration is even more important because technological innovations have had only a marginal role; in any case they have appeared after organisational decisions had been made. In the "natural laboratory" of our cluster, it is cooperative relations which reduce transaction costs; relationship organisation-creation of competencies is the real engine of growth.

Let's take a quick look back over the steps in our position:

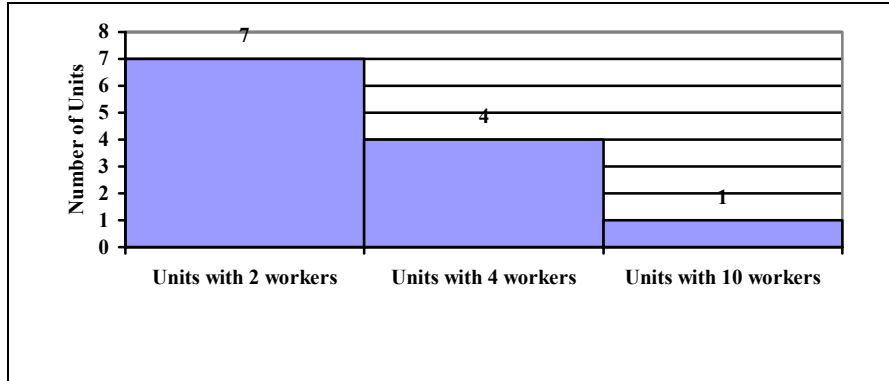
- the change in the degree of integration depends not on the available resources, but on their specific role in the process; the change in the degree of integration simultaneously affects all the processes performed jointly, regardless of their degree of similarity in terms of final product;
- each change in the degree of integration will modify the cost structure. This means that the innovation will have repercussions on the entire costs/opportunity structure of the economic relationships; if this system of relationships is not examined, the change will be transformed into an externality;
- Regardless of the integration hypothesis, the division of labour implies the search for a balancing of processes; however, the outcome will be unpredictable with regard to the size of the individual units.

### *2.3. Process divisibility and firm size*

Let us now envisage that a production chain is producing a given amount, at a certain moment in time, with a fair amount of difference in the transactive costs between inside and outside the cluster; at this point, the size of the inside units will be distributed with the same probability density as all the possible integration/market combinations of the indivisible stages.

Using the data of the theoretical graphs, we will see that the model shown in part 4) in Fig. 2 allows us to imagine four possible efficient configurations, all equally likely. The four combinations we can see are:  $A \oplus B \oplus C \oplus D \oplus E$  (1 firm with 10 workers);  $A \oplus D + C + B \oplus E$  or  $A \oplus B + C + D \oplus E$  (4 firms with 4 workers each and 2 firms with 2), and finally  $A + B + C + D + E$  (5 firms with 2 workers each). If we now measure the size of the firms (in terms of number of workers employed) we will obtain the theoretical distribution illustrated in Fig. 4.

Fig. 4 - Theoretical distribution of economic units in a process of social division of labour



The outcome does not depend on the numerical example shown, but is a generalisation of the theorems of the divisibility of processes (Tani 1986). Firms have a “size” because they consist of indivisible units (they benefit from economies of scale); however, they do not have an “optimal size”. In fact, the degree of integration of the indivisible production units (i.e. the distribution of ownership rights) is completely irrelevant.

We have thus verified the *local* validity of Coase's theorem, which can be restated as follows: with the same transaction costs and in competition, the social division of labour means there is no optimal firm size. A “lemma” can also be added to the theorem: firms’ size distribution depends on the divisibility of the processes involved in the supply chain to which they belong.

The theoretical result obtained does not imply constant economies of scale by any means: increasing returns are present within the cluster units, but they are also higher within the cluster as an aggregation, due to its ability to cut transactive costs, compared to the situation on the outside. In view of these characteristics, it seems more correct to talk in terms of firms’ network, or net-dimension.

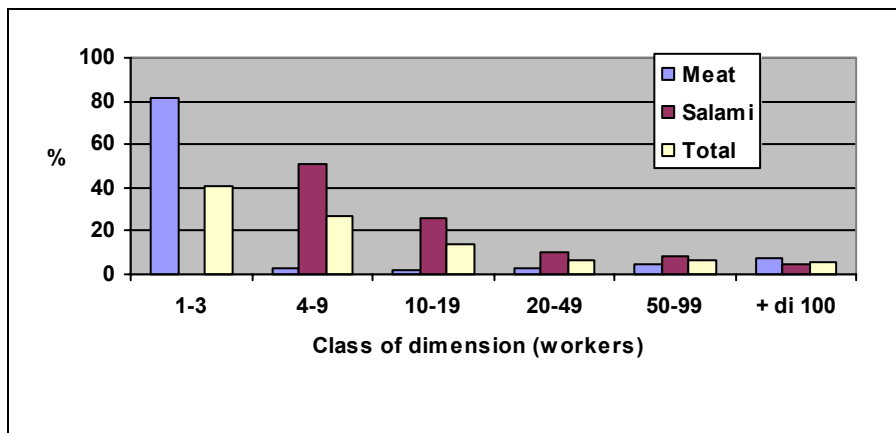
For our purposes, it is important to reflect on the economic mechanisms which allow us to accept the distribution shown in Fig. 4 as theoretically possible. One initial explanation might be that a growth in the size of units, with the aim of achieving economies of scale, goes hand-in-hand with the breakdown into increasingly specialised stages. The result is an increase in the competencies which may lead to new entries and competition, not only on the final product, but also on the individual stages. This has important methodological implications: faced with the many possible combinations of the firm-unit, the formation of complex analysis units will always take place “out of equilibrium” (Amendola *et al.* 1998),

since there is a continuous process of seeking for a net-dimension for businesses (Stigler 1951).<sup>5</sup>

In Fig. 2, part 4), we see that – in the absence of transaction costs, i.e. for co-ordination– each industrial organization is perfectly compatible with the production of the maximum output at the minimum cost. These propositions can be tested empirically, based on the expected sizes of the units within a cluster: if processes are divisible, the "parts" appear more frequently than the "whole"; therefore, smaller units will be more likely than larger ones.

Fig. 5 illustrates the breakdown of the firms in the case study by size class: empirical observation does not seem to disprove the theoretical propositions. Thanks to the possibility of separating the stages of the cycle – and the low transaction costs between firms – the distribution observed is compatible with the theoretical one predicted in Fig. 4.

Fig. 5 - Firms by sector and worker number category (2002)



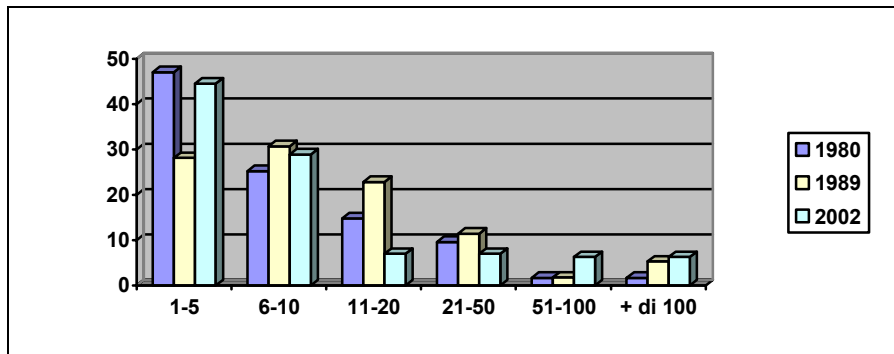
Source: R&I 2003

On the other hand Fig. 6 illustrates the evolution in the distribution of firms in the empirical case observed: the structure is constantly changing, especially in the smallest firms, which modify their function as link and "reservoir" in the economic cycle; in this way, they appear to play a cushioning role, absorbing fluctuations in demand. On this head, it is important to note that the costs of the change in the division of labour are kept down thanks to the selection —over time— of organisational and contractual solutions

<sup>5</sup> "...facts prove that real distributions are quite even and similar to each other and resemble the upper tail of a Pareto distribution" (Simon 1987, p. 468). Conversely, the hypotheses of the marginalist theory on the U-shaped form of costs lead to forecasts with increasingly large errors with regard to both the shape of the individual cost curves in the short term and the trend forecast. The standard theory is therefore not able to supply any verifiable explanation of the dimensional distribution of the companies within a sector.

which are an integral part of the cluster's way of operating. This feature constitutes a collective asset of the economic grouping observed; as such, it becomes a form of *social capital* for the cluster. We will discuss this issue on the empirical ground in greater detail in part 4.

*Fig. 6 - Modifications in the sector structure*



Source: data from CCIAA and R&I

### **3. The empirical evidence: the processed pork supply chain**

On the ground, the production process stages are clearly divided into rearing, slaughtering, sectioning, transformation into cured pork products, curing and other processes (fats and waste); there is a high degree of division of labour between firms, with strong specialisation in a single processing stage. The large amount of subcontract working has stimulated the foundation of small enterprises: the firms are linked by a network of inter-industrial relationships involving the mutual supply of specific products, essential for the production process of each player. The network of relationships also involves the trade in finished products, ready for distribution, which firms purchase from each other depending on order trends.

Below, we examine the various stages and highlight both their structure and their development over time, focusing above all on the last decade, the period during which the effects of the global market have been most strongly felt.

#### **3.1. The agricultural component: breeding**

Breeding is the first stage in the production chain. The establishment and growth of this business was encouraged by cheese production (Parmesan), the by-products of which were traditionally used for rearing pigs; this underlines the importance of the synergies between local production chains for the establishment and development of the cluster.

Farming trends have mainly followed the usual pattern for EU countries from the '70s onward, becoming more and more specialised and concentrated in a smaller number of bigger farms.

In view of the workings of the Common Agricultural Policy (CAP), for the farming sector the effects of internationalisation date from the '70s; more recently, the CAP has focused on establishing a common system of rules and regulations relating to health and environmental standards, which has accelerated the trend towards specialisation in suitable structures.

As we will see in greater detail below, the consolidation of the downstream processing business has led to demand for a growing amount of raw material for transformation; this has led to the strengthening of links with the adjoining areas (other provinces in the same region or other regions of Italy) and, above all, with the international markets, while local ties have relatively weakened. This becomes very clear if we observe Fig. 9 and Tab. 3; furthermore, there has been a reduction in the proportion of farms linked to dairies (from 73% in 1995 to 38.5).

As a result of the sharp changes in the firms and their links to the markets, one naturally wonders whether we can still talk in terms of a local production system. On this head, the data must not be read as a breakdown of the local synergies under pressure from opening-up of the international markets. Rather, the systemic reading of the latest phenomena indicates that the overall growth of the segments downstream led to an increase in demand for raw material and, with it, a growth in the use of environmental resources. This triggered constraints deriving from institutional measures which forced firms to internalise - at least in part - the costs of the use of environmental resources. This phenomenon, alongside the usual processes by which the less efficient farms go out of business, encouraged the rationalisation of the farming business, obvious in the increase in the size of farms and the reduction in livestock numbers, already referred to. The growth of the system has therefore driven the supply chain to open up increasingly to the international markets.

It must not be forgotten that the local system is the most important pig farming area in a region which is amongst the Italian leaders in this sector. Therefore, by maintaining the integrated system, the downstream industry is an important factor in defending the local agricultural base of the supply chain itself; from this point of view, opening up to the international markets has not jeopardised the local dimension of production.

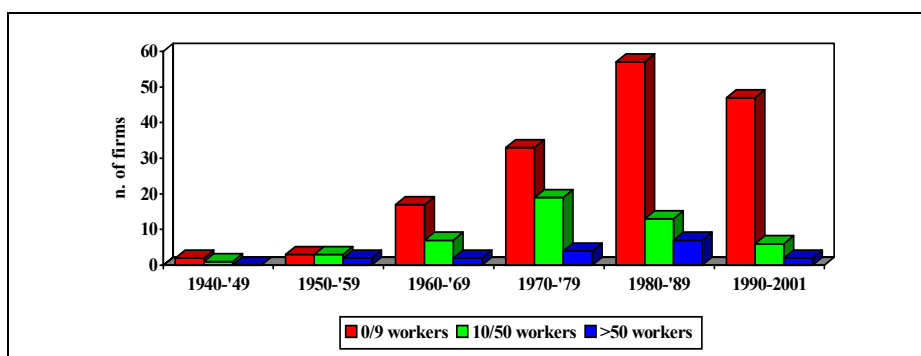
### 3.2. General features of industrial transformation

According to the Chamber of Commerce data, in the area there around 200 firms, 10% specialised in slaughtering, 40% in sectioning and 50% in transforming meat into traditional Italian products. Fig. 5 above illustrate the distribution of firms by class of dimension (in term of worker units).

The business has roots that go deep into the local culture, before historical records began: however, it was starting from the '70s in particular that industrial processing really took off, largely concentrated on the work of small and medium enterprises with strong links to the local farming tradition (Bertolini, 2002). The '80s witnessed a consolidation of the business, understandable from a sharp acceleration in the number of firms registered with the Chamber of Commerce; the trend has continued over the last decade, since the number of firms has kept increasing, although at a slower rate (Fig. 7). The number of those employed in the sector has also increased at the rate of about 2% per annum over the last five years; it is important to underline that this industry is the province's largest food-sector employer, and is highly significant in the national context (10% of the total amount of national enterprises).

The growth of business at the local level has benefited from the upward trend in domestic consumption. However, Fig. 8 reveals that firms are export-oriented, a feature reflected in the trend in applications for the EU certification essential for access to the European markets. This process indicates the importance of the European dimension: the impact generated by the launch of the Single Market in 1993 is noticeable.

Fig. 7 - Firm registrations with the Chamber of Commerce



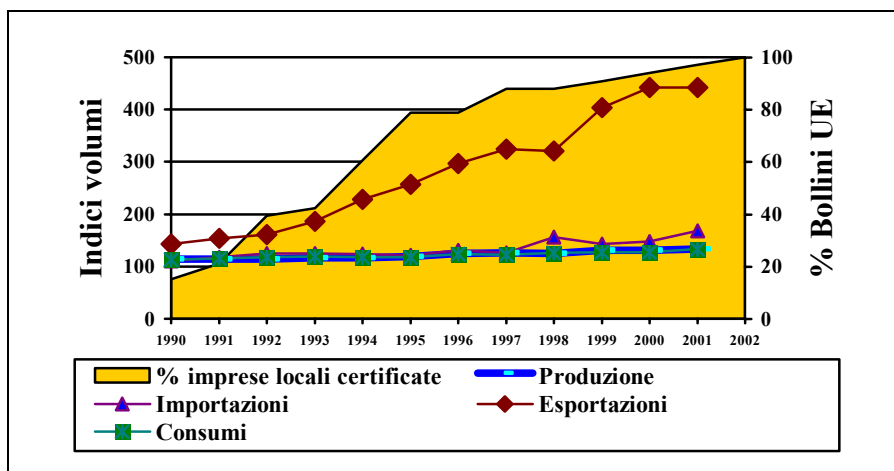
Source: Our processing of Modena Chamber of Commerce data

Fig. 9 and Fig. 10 allow us to make a more detailed examination of relations with foreign markets. The trend in the local production system's exports and imports indicates that they are of considerable importance, particularly with regard to the purchase of raw material: 56.4% used as fresh meat and 38.3% for processed

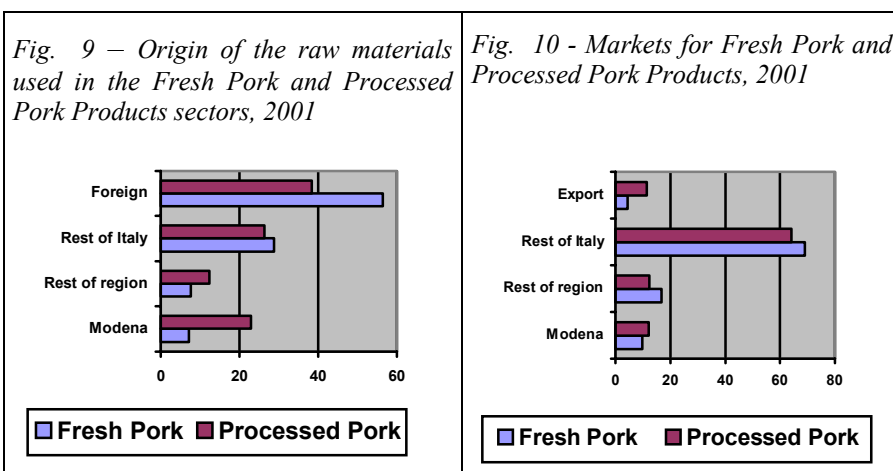


pork products. Although exports are significant, the figures are lower (11.4% for processed products and 4.5% for fresh meat); the domestic market is far and away the most important one (65-70% of output). Therefore, thanks to its full integration with the international markets, and the European market in particular, the local production system has become a major transformer-supplier for the domestic market. The local market (regional or provincial) is also important (around 25%) but decidedly less so than the domestic market as a whole.

Fig. 8 – Production, consumption and foreign trade of pork products (Italy, 1986=100); percentage of local firms with EU mark



Source: ISTAT and direct surveys



Source: R&I 2003

If we look at firms' sizes, most are small and medium enterprises: only 12% have more than 50 workers (Fig. 5). Most firms are therefore at the artisan level: they are small workshops, specialising on a few specific operations, often requiring a high degree of local knowledge, essential for assuring the quality of the product.

One good example is provided by firms specialising in the trimming procedure, where the operative's manual skill minimises waste and ensures the quality of the product.

The empirical analysis provides a direct demonstration of how ambiguous the concept of "dimension" can become if it is considered independently of the context in which the division of labour occurs. The "small" enterprises comprise two types of firms fitting into two different functions: the first, more numerous, comprises a large number of subcontractors, specialising in sectioning, with a very high level of specific expertise that is one of the system's "lubricants"; on the other hand, there are small independent firms working for the final market. In fact, the know-out – collected, conserved and reproduced by the subcontracting firms – is one of the components of the area's *social capital*: apart from being a "lubricant", this know-out also acts as a "glue" within the network (Anderson *et. al.* 2002). The paradox is apparent: these competencies (social capital) are an economic glue for the cluster, and a lubricant for firms' organisational decisions. This subject will be discussed in greater depth later.

From the point of view of the cluster, the diffusion of competencies is a crucial element for reducing firms' transactive costs in two directions: specialization and innovation. For instance, some sectioning firms are actually able to display sets of samples of the "cuts" available; it is no surprise that these firms are also net exporters in relation to other areas of Italy.

Tab. 1 shows the functional positions of the various types of firms. Subcontractors account for a significant proportion of the total firms (54.7%), although they are mainly of small size: on average, these firms have just 3 workers, but they still account for about 7% of total employment. Subcontracting is therefore an important factor in ensuring the survival of small producers.

*Tab. 1 - Distribution of local units and workers by type of firm*

	Firms %	Workers %
Final Producer firms	42.4	82.3
Subcontractor firms	54.7	6.5
Subsidiaries of firms located outside the province	2.9	11.2
Total	100.0	100.0

Source: (R&I 2003)

Small and medium enterprises continue to play a significant role in spite of the major structural changes the business has undergone. As we will see below, the search for economies of scale is not in conflict with small size; this empirical observation does not conflict with the theoretical debate on the structure and functioning of this type of cluster.

### 3.3. The first transformation stage

The firms which carry out the first transformation stage (abattoirs) act as link between two complementary segments: the farmers on the one hand and industrial processors on the other.

Over time, this business has become highly concentrated in just three large facilities, which process about 94% of the livestock. This situation is the outcome of the changes which have taken place during the last decade, particularly as a result of the health and hygiene laws imposed at various levels (European, national and regional).

If we examine the latest data, (Tab. 2 e Tab. 3), we will see that the volume of the product processed has increased significantly (+38.6%), in spite of the drop in the number of facilities (-11.1%) and local farming; what's more, specialisation has increased the difference in firms' size.

*Tab. 2- Annual livestock numbers slaughtered by firm size*

Organisations	Head slaughtered		%		Facilities	
	1995	2001	1995	2001	1995	2001
Medium-large (>50,000)	807,739	1,199,493	87,2	93.3	3	3
Small (<50,000)	118,854	85,500	12,8	6.7	15	13
Total	926,593	1,284,993	100.0	100.0	18	16

Source: Data from Sisvet

While the production capacity of local farms is falling, that of the abattoirs is increasing; the search for economies of scale seems to have led firms to break free of the local production dimension. The link is only maintained for local business which is peripheral from the geographical and economic point of view (locations in the nearby mountains and niche output of some particular traditional products).

*Tab. 3 - Farming, slaughtering and sectioning in the Province of Modena: local and international dimension*

	1995	2001	1995-01
Total meat slaughtered in the province (tonnes)	115.817	160.624	+ 38,6
- raised in the province	91.186	61.618	- 32,4
- raised elsewhere (Italy/abroad)	24.631	99.006	+ 302,0
Total meat sectioned in the province (tonnes)	311.987	412.156	+ 32,1
- from Italy (including province of Modena)	147.320	158.737	+ 7,7
- from abroad	164.667	253.419	+ 53,9

Source: data from Sisvet

Relations outside the local area were already significant in 1995, since 21% of the material transformed came from outside the area; in 2001, this dimension had increased to 61%. However, as we will be specifying in greater detail below, this feature does not affect the cluster's structure and lines of development: for example, the largest firm is a co-operative enterprise, and a large proportion of its turnover (not much less than 50%) comes from products with local quality certification.

### *3.4. The second transformation stage*

This comprises a series of heterogeneous activities, providing the link between several different nodes in the network. In this stage the firms, established as small subcontracting outfits, have expanded and specialised over the years to form an important pole accounting for 36% of domestic output (31% in 1995).

What was initially considered an intermediate stage has now become one of the cluster's main businesses: specialisation has powered an expansion of plant size, although medium-small enterprises are still operating alongside these larger outfits.<sup>6</sup>

If we examine the data relating to the origin and destination of the products these firms transform, the interweaving of the local and international dimension is clear once again. Foreign markets are important in supply terms, since the area imports more than 50% of the material transformed from foreign countries. Moreover, during the last five years the quantity of goods of foreign origin has increased by 54% (Tab. 3). Following their own growth strategies, the sectioning firms have become the main market in Italy for Dutch and Danish pork.

With regard to the destination of the material handled, the local demand from the downstream transformation industry is of considerable importance, but still only accounts for just more than one third of the total amount processed (37%) (Bertolini 2002). This can be considered as simply the starting-point for the development of a complex of activities reaching well beyond the local context.

Abroad, meat is prepared for processed pork producers by the abattoirs themselves. In Italy, on the other hand, and especially in Modena, these intermediate stages were originally carried out by final producers themselves. The increase in the variety of products, one specific direction innovation has taken, has triggered a wide-

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<sup>6</sup> For example, in Castelnuovo, where is located the activity core business, there are six large companies performing this process (capacity over 10 thousand tonnes.), while in the downstream stage of transformation only one firm reaches these volumes.

spread, varied demand for sectioning services; in turn, this has led to an increase in the division of labour along the supply chain in accordance with model (4) in Fig. 2, already explained in point 2.3. This has provided the stimulus for the establishment of firms specialising in tasks with a high traditional know-how content, especially the use of the knife to produce the cuts provided. It must be remembered that the operations linked to sectioning are of major importance for the quality of the final product; specific skills in these stages allow the reduction of waste, with an obvious impact on the overall production costs. The growth of the cluster itself would be difficult to imagine without the strong relationships this segment has established with the international markets.

### 3.5. *The third transformation stage (final products, fats and waste)*

As for the sectioning sector, in this phase there are several types of production. They differ both in the duration of the production cycle (long in the case of hams) and in the destination of the transformed product (for the final market of consumption or further processing).

Leaving aside the significant differences between the various activities, the stage of the transformation of the processed meat into cured or preserved products in general terms accounts for about 13.3% of total Italian output in the sector. During 1995-2001 the area consolidated its position, with a growth both in the quantity produced and in the number of processing facilities; however, the concentration had only limited effects and the business is still highly fragmented in medium-small units, as in the rest of Italy (Tab. 4).

In spite of the fragmentation, it is worth noting that the area is home to both the country's largest firm and other leaders with brands well known at the national and international level. The largest group is a co-operative organisation, and it is significant that its members also include the leading slaughtering and sectioning firm; the importance of the co-operative movement in guiding and promoting the local system is clear.

*Tab. 4 - Processing plants and quantity produced in tonnes*

Transformation activity			
	1995	2001	Variations
Quantity produced in tonnes	111.000	190.000	71,1%
Plants >1,000 t./annum	22	88	300%
Plants <1,000 t./annum	107	95	-11,2%
Total Plants	129	183	41,8%

Source: data from Sisvet

The firms are linked by a close-knit network of inter-industrial relationships involving the reciprocal supply of specific products, essential for their individual production processes; this trade also involves the final product, ready for distribution, which firms purchase from each other in response to trends in orders. In this segment, the relationship of competition and collaboration between firms is particularly similar to a feature typical of industrial districts.

There are two more forms of business of which play important roles: the curing of hams on the one hand and fat processing on the other. Hams are cured in small-medium sized facilities, working on a sub-contract basis.

The segment which processes fats (and waste), on the other hand, is strongly concentrated in a few large-sized firms of significance at the national level. It should be noted that this business provides a solution to dealing with the large volumes of waste produced by the various processing operations. Its role is very important because of the environmental benefits it generates; encouraged by the careful monitoring by the competent institutions, it has become an economic opportunity which the cluster has succeeded in conserving within itself.

One significant example is provided by the history of one of the five firms which has been operating in the sector on a stable basis for many years. The firm began its business by collecting the waste bones from the local industry to transform them into protein meals; over the years, assisted by the rapid expansion of the local market, it has achieved impressive growth in size and technology, and is currently a national leader with a market share in excess of 30%. The firm's history is a good example of the positive synergies of the cluster under observation.

### *3.6. The role of the co-operative movement and traditional quality marks*

It would be difficult for the district's economy to exist without the co-operative movement and traditional quality marks; these two factors have been, and continue to be, vital engines for the activity's economic success (Bertolini 2002). We have already mentioned the role of the co-operative network of Parmesan cheese producers in pig farming. Even today, the joint activation of the processes has allowed the rationalisation of the costs and the achievement of economies of scope, through the possibility of rotating the labour force.

Local quality marks were in use long before they achieved European recognition (Bertolini 1988; Giovannetti 1988, 1994). The formation of these marks is a significant indicator of the area's

good organisational capabilities; by defining and complying with collective rules, the producers have been able to overcome the fragmentation of output by constructing a collective product image. It is important not to forget the cultural and economic importance of the massive institutional undertaking involved in drawing up rules for the distribution of risks, incentives and revenues, democratically decided on the basis of principles of co-operation. The positive effects of these principles are particularly noticeable in the definition of quality standards.

A collective brand is a *common asset* which cannot survive without co-ordination and distributive rules, especially if this brand is based on a strong image of quality. It is equally obvious that the more the firms concerned are small, numerous and fragmented, as in the case of the area's economy, at least at the origins of the district's history, the more difficult the co-ordination will be. In this case, product promotion is made possible by means of an agreement between the various players operating in the area (farmers, transformers and local institutions); this also implies an organisational capability, aimed at managing the relations between the economic and institutional players at the various stages.

In this context the co-operative movement has played a fundamental role, as has emerged on several occasions in our analysis, and as we will also be discussing below.

#### **4. Governance and “social capital”: an outline history of a network-firm**

In section 2 we discussed the way in which process integration mechanisms determine the different organisational "architectures" which can be observed. A close link has therefore been identified between these models and cost trends, illustrating the relationship between organisation and economies of scale. Finally, we demonstrated that a multivariate system, capable of assigning an efficient role to small-sized firms, is fully sustainable. On the basis of these comments, we produced a forecast of the expected distribution of firms by dimensional class. But these results need an economic explanation, closer to the empirical ground. The key is again the transaction costs.

Briefly, we are able to identify three groups of actions, which allow the reduction of transactive costs:

- Sharing of profits and losses, especially in adverse economic conditions, between the various players in chain, thanks to the increase in the co-ordinating and pricing functions from the firms with access to the final markets;
- Proportional variation in output volumes and degree of integration between the various stages in the chain: less integration

and increase of specialisation during periods of growth, shrinkage of the number of firms and greater integration during periods of consolidation or recession;

- Modification of functional relationships on the labour market: self-employed workers during phases of growth, who become employees during stages of consolidation and/or unfavourable economic conditions.

As we can see, all these actions are coherent with the characteristics attributed to *functional* clusters: the existence of primary relationships, the concentration of trade, and mutually-oriented decisions (Rauch *et al.* 2001; Zuckerman 2003); these actions can be directly observed in firms' make or buy activity.

The features described can be identified over the development and in the behaviour of the sector's largest firm, which can be considered as an archetype of the functioning of the cluster under analysis: the co-operative "Coop A"<sup>7</sup>, the largest firm in the sector.

The firm is a system with three poles from which its economic and contractual relationships with the supply chain and the network lead out. Firstly, it is essential to remember the philosophy of relations inside the firm, coherent with the principles of the co-operative movement, fundamental for the functioning of the system.<sup>8</sup> Secondly, the continuous internal monitoring of industrial costs is an important factor; last but not least, the management of the network relationships with suppliers and the distribution is a key element. These relationships are constantly subjected to a dual constraint: they must assure the quality of the production chain on the one hand, and the flexibility of the volumes of unfinished and finished products exchanged between the various stages on the other. In response to continuous fluctuations in consumption, the system allows the assurance of internal and external synchronisation between the different stages, the saturation of the production capacity, and the expansion of the typologies of products offered.

If we assume the point of view of O. Williamson (1991), and the "incomplete contracts" theorists, the negotiations between individuals-agents –with such specific aims and relationships– must deal with every kind of risk, including that of possible opportunistic behaviour by business partners. In these conditions, it is reason-

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<sup>7</sup> Fancy name.

<sup>8</sup> In the many interviews conducted in the late '90s, "Coop A" made available the minutes of the Board meetings from the previous years. We note that in many minutes, the case of Ms M. is included amongst the "Any Other Business". The Chairman informed us that Ms M. was the only person ever to be dismissed from the firm, since its foundation, for disciplinary reasons; serious, repeated absenteeism (for family reasons); for this reason, the decision was the outcome of lengthy discussion, and eventually an agreement was reached with Ms M. herself.



able to think that the transactive costs might be so high as to trigger the integration of the processes in few large firms. This derives directly from an analytical framework which does not give any consideration to historic time and to the complexity of the relationships established over it: culture, memory, institutions, personal relationships and all those factors which guide individuals' relational behaviour.

From this point of view, if we return to the empirical case and examine the firm's contracts with its suppliers, it is surprising that there are basically no specific clauses other than the definition of the quantities per type of product, price and delivery terms: the relationships are so habitual that during interviews, the operators found it difficult to associate the very idea of a contract to these transactions, often arranged solely by telephone contacts. All this can only take place, "naturally", within specific, shared contractual institutions.

Let's take another example from the interviews. "Coop A" recognises that firm Z, from which it purchases a given product essential to complete the variety of its product range, offers superior quality. The product is of a clearly defined type and only firm Z supplies it; the specific nature of the relationship is reflected in the long-established habits of the economic relations between the two firms. In other words, in the logic of the forms of trade, the only firm in competition with Z is "Coop A" itself. In fact, the level of contestability of Z's market depends on the behaviour of firm Z itself. If its demands - always put forward within a process of direct negotiation - are considered "reasonable", "Coop A" will divide the overall quasi-rent in relation to its own specific investments in the distribution and the special features of Z itself (technical skill, human capital, standards in the selection of materials, reputation, etc.). If no agreement were reached, the mutual advantages of the specific production and distribution process would be lost.

Apparently, this is a bilateral monopoly, in which the competition for the quasi-rent and the associated possible opportunistic behaviour might lead –sooner or later– to a form of integration. One of the top managers' reply to an explicit question about the risks of opportunistic behaviour on the part of Z was: "we know that Z knows that *we* know how to make it too". The reply requires very careful reading, not just as the verification of the existence of Nash equilibrium in a repeated-game. Of course, "Coop A"'s latent "threat" is credible: if Z's demands are considered unsustainable, "Coop A" is really capable of producing a "similar" product directly (or looking for a substitute on the market): "in fact only an expert consumer would notice the difference". What really counts is the certainty that Z "will not behave in an opportunistic way".

What makes “Coop A” so sure? Why is trust, and not opportunism, the foundation of the system of relationships?

The key to the answer is not to be sought in probable behaviour, in a “logical future”, nor in the firm's long history (the firm records *only one* law suit with an *occasional* supplier). The firm's convictions derive from the way in which primary relationships are constructed, from the action of mutual orientation, from its role as a “concentrating” agent in trade, and in general from the firm's role as an institution capable of promoting co-operative action. As we have already stated, the literature on clusters assigns a fundamental role in achieving economic significance for the grouping to all three of these actions. In short, what is interesting is not so much “Coop A”'s action as a “player”, but rather as a “state of nature”.

With reference to the construction of primary relationships, it is important to emphasise that they are constructed in the form of a network. On this head, the previous part has already analysed the relationships within the supply chain and the organisational importance of the co-operative sector. Alongside this, it is important above all to underline the action of the redistribution of revenues amongst all members of the network, fundamentally important in the formation of the dynamic equilibriums within the network itself. This action takes place in accordance with a principle of “fairness” – founded on “reciprocity” in the evaluation of costs – which provides the basis for the formation of prices in transactions between the segments of the supply chain. This evaluation action, in turn, is the outcome of real processes, which can be empirically observed. For example, the firm plans its purchases on the basis of its own and its suppliers' production capacity:<sup>9</sup> for each product type, and the commercial department retains a memory of the daily, weekly and monthly demand. Production processes are synchronised in relation to both the internal production capacity available and the network of suppliers. At the same time, the knowledge of the industrial costs of the individual process is extremely detailed, and constantly updated by the R&D department within the firm itself.

Naturally, between the “virtual” supply chain which “Coop A” designs to satisfy demand and the “real” chain, there lies all the activity of organising the internal production lines and negotiation with the network of suppliers. In a perspective of long-term collaboration, the most efficient economic solution is identified em-

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<sup>9</sup> It is important to note that this information, collected by specific questionnaires and focusing on habitual relationships, is known to “Coop A”. Naturally, knowing a competitor's production capacity does not necessarily imply knowing its costs, but this is assisted by the knowledge current within the district and the existence of strong competitive mechanisms on all factors markets.

pirically: the network is considered as an integrated unit. This implies aligning incentives in proportion to the direct and indirect industrial costs of the individual units. To achieve this, the use of production capacity must be distributed evenly over all the firms in the network, regardless of the level of the aggregate demand the cluster is facing.<sup>10</sup> Another result of this is a deepening of the social division of labour through the propagation of incentives and the search for new partnerships.

Of course, any strong fluctuations in demand may trigger, in Williamsonian terms, a breakdown in the alignment of incentives; the existence of shared distribution criteria reduces but does not completely eliminate these risks. In an industrial structure like the one described, the organisational solution for reducing the risk of an unexpected fall-off in the level of production activity is the complexity and variety of the network itself.

The accepted, and mutually encouraged, behaviour, is that which promotes economic relations with other members of the supply chain. In all interviews with “Coop A” suppliers – alongside the explicit confirmation of the need for stable, long-term relations with customer firms – the *leitmotiv* was the diversification of risk by maintaining a portfolio of a large number of orders; interviewees also repeatedly stated that they would not accept orders capable of saturating their production capacity completely and for long periods. This policy is based not so much on the fear of possible default on the part of the purchaser; the real fear is that unforeseen circumstances may make it impossible to fulfil the contract exactly as agreed, putting the firm’s *reputation* at risk. In brief, the possibility of recession does not modify the theoretical picture founded on the advantages of co-operative behaviour. Once again, the possible breakdown in the alignment of incentives does not necessarily have to be imputed to opportunistic behaviour: it is empirically more justified to consider a recession as a factor driving the search for alternative industrial solutions.

These comments provide the premises for what is perhaps the most significant point in the definition of a cluster as a unit of study: the mechanisms of mutual orientation. In reality, this concept implies the simultaneous action of a large selection of empiri-

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<sup>10</sup> For a discussion on the congruency of the degree of use as indicator of transactive costs see Giovannetti (1996, 2001). It is important to note that the statement, claiming that the degree of use for equivalent processes within the network is identical, is another way of stating "Coase's Theorem": in the absence of profit effects (incompletely exploited economies of scale) and a definition of property rights (institutional rules on the retribution of factors), efficiency (the degree of use of production capacity) is achieved regardless of the distribution of property rights (it does not matter how the processes are integrated).

cal variables: the construction and defence of a system of long-term relationships; mechanisms not only of the exchange but, above all, the joint-production of information; creation of a system of shared and mutually adopted rules; compliance with agreements, delivery and payment terms; joint analysis and sharing of risk and, last but not least, fairness in the distribution of the advantages of co-operation.

It is important to note that all the listed factors can be summed up in the concept of an *environment with low transaction costs*. The combination of factors just described can also be considered as “social capital”: the flow of benefits that derives from it is measured against the costs of the resources invested in institutional action, in much the same way as management costs are compared with the advantages of integration. It is due to the common availability of this “capital” that the environment is particularly stimulating for the introduction of new organisational models, products and firms.

On the empirical level, the action of these forces can be noticed in the very moment when an organisation sets out to reshape both its internal structure and its network of external relations, in order to take a new path to innovation<sup>11</sup>.

One significant example for the “Coop A” network is the introduction of the Total Quality system. Further to certification under the UNI-EN 29000 norms, the “Coop A” R&D department drew up very detailed procurement requirements with the technical specifications and guarantees required for each type of product, relating to physical, chemical and microbiological characteristics, appearance, flavour, etc., together with wrapping, packaging and storage procedures. Through a lengthy, complex negotiation process, the entire network of suppliers has been made familiar with these documents, and all suppliers have undertaken to comply with the stated standards. In this action the firm is definitely using its market strength to bring the system into a competitive equilibrium as quickly as possible. Reference to these “private standards” is internalised by the parties, to the point where it disappears in the finalisation of current contracts. In fact, the quality standards are a benchmark institution in transactions, extending beyond the “Coop A” network: the quality culture and organisational and technologi-

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<sup>11</sup> As an immediate counter-demonstration, this model can be compared with other models of clusters (poles or agglomerations) with hierarchical relationships: the large companies predominance over the subcontracting network, doesn't create social assets (information, formation of competencies, technology transfer). It is especially important to remember the serious, lasting damage caused when the large companies, in other types of clusters, experience economic difficulties or undertake restructuring.

cal solutions adopted cease to be a “private asset” and assume - through the extended network of relationships - the characteristics of “social capital”.

The structure described is one important distinctive feature of the cluster, linked to its form as a social network (Gordon *et al.* 2000); due to its characteristics, innovative choices made within this type of network modify the social capital, and for this very reason they inevitably spread through all the members of the cluster. In view of these characteristics, we feel justified in stating that, from the outside, the system does not behave very differently from a big, vertically integrated company, capable of taking on the international competition on its own.

However, it must not be forgotten that if the entire system is to function, the bad coin of speculation on "savings" in quality must not drive out the good coin of long-term investments. For example, in order to align all operators' incentives in this direction, strict monitoring by health authorities has an importance reaching well beyond the general protection of public health. A consideration of public institutions, another fundamental player in the cluster's equilibrium, would open up another front, too broad and important to be dealt with in the space of this work.

## **5. Conclusions**

Partly through the effects of globalisation, there has recently been considerable evolution within the cluster examined; the lines of development have many features which strengthen the previous structure and organization, and do not reverse it. The case study has allowed us to verify the strength of the hypothesis of a unit of analysis different from the firm, for the discussion of problems of innovation and development. The discussion has touched on the classical themes of the efficiency of the net-economy based on small and medium enterprises, and their prospects in a context of growing globalisation. For this purpose, in the paper we have underlined that the expansion of the domestic and international markets has been an important opportunity for the growth and reinforcement of the cluster as such. At the same time, due to the success of these consolidation phenomena, the cluster has been identified as an engine for the process of the international expansion of trade.

At the empirical level, we have confirmed the economic role of the small producers, while highlighting the dimension of network relationships; from the analytical point of view we have attempted to emphasise that the cluster has institutional rules and coordination of economic activities, capable of rendering its behaviour coherent and "autonomous". On other hand, the case study has

confirmed the distinctive features of Italian food districts: the coexistence of small and large enterprises and their reciprocal functionality; the dense network of relationships between the players; their capability for creating institutions which co-ordinate and defend the local dimension; the coexistence of the local and global dimensions of production.

In this work, the concept of “transaction costs” has provided the link between the theoretical and empirical aspects. Theoretically, “transaction costs” have to be considered at each level of integration (process, plant, firm, cluster, etc.); the institutional structures described allow us to explain the concrete action of the different solutions – private and collective– in manipulating and reducing these costs, and thus leading to the emergence of complex units. The work has proceeded along these lines, discussing the formation, role and evolution of the cluster's institutions. In order to highlight the simultaneous presence of economies of scale at the single unit and aggregate levels, we have proposed the concept of the net-dimension.

On the empirical ground, one factor to emerge has been the crucial role played by quality (PDO - Protected Domination of Origin) products - a blend of production culture and local organisational capability - to the point where it would be difficult to imagine the very existence of the local system if such quality marks were not available. From this point of view, we have underlined the strategic role played by the co-operative movement, still a fundamental element in the cluster's organisation and consolidation.

As we have already emphasised, the case study has revealed an impressive ability to adapt to globalisation. However, some weaknesses can be observed, all linked to the “nature” of resources: some linked to internal and some to external forces.

Among the internal factors, the crucial points relate mainly to the reproducibility of the local resources: competencies, “equity culture” and environment. In the future, the internal weakness factors may be: restrictions on the use of land and environmental resources; a slowing-down of the capacity for innovation, or for the governance of technological and organisational adaptations; a lack of entrepreneurial renewal in the smallest family firms, and a difficulty in reproducing labour with the technical skills specific to the cluster. In the past, these limitations have been overcome easily thanks to the “social capital” available.

Amongst the external variables, the role played by institutions in the future emerges once again. For example, in the current WTO negotiations, it is strategically vital to protect a conception of quality which includes the cultural values of local know-how, and to defend variety as a resource, counteracting the trend towards uni-

formity: we believe all this constitutes the frontier along which the processes of the expansion of trade must progress.

One other example of external constraints is provided by the general rules affecting the reproducibility of the organisms of economic co-ordination (co-operative movement, collective brands, economic policy institutions, etc.). As we have seen in the case study, these play an essential role in the cluster. On this head, looking ahead to medium-term policies, we believe it is essential to create a culture favourable to institutions providing collective co-ordination, which must be given the same theoretical standing as the “firm” itself. The debate is still open in this area.

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