

**Path-dependency vs. industrial dynamics: an analysis of two  
heterogeneous districts**

By Fiorenza Belussi

Communication to  
**European Meeting on Applied Evolutionary  
Economics**

7 - 9 June 1999, Grenoble, France

Organised by the Institute for Energy Politics and Economics  
*Organisé par l'Institut d'Economie et de Politique de l'Energie /*  
IEPE, BP 47, 38040 Grenoble Cedex 9, France

And the INRA-Unit of Sociology and Economics of Research and Development  
*Et l'unité Sociologie et Economie de la Recherche Développement de l'INRA*  
INRA/SERD, BP 47, 38040 Grenoble Cedex 9, France

## Path-dependency vs. industrial dynamics: an analysis of two heterogeneous districts

By \*Fiorenza Belussi (\*Università di Padova)

May 1999

Fiorenza Belussi is Research Fellow at the Department of Economics "Marco Fanno" at the Faculty of Statistics -University of Padua. Her field of research is the analysis of local industrial systems. She has carried out a great deal of empirical work and published widely on the issues of industrial innovation in Italy and on the analysis of network firms. Her areas of interest are the following: a) industrial innovation - models of firm innovation, b) industrial dynamics, - entry and exit processes of firms, c) industrial policy - innovation policies at local level and the processes of macroregulation. She has published various books and articles, and among those, *Nuovi modelli di impresa, gerarchie organizzative e imprese rete*, Angeli, Milano, 1992, 1-414; Belussi F. and Pozzana P. (eds), *Nuovi modelli di impresa, gerarchie organizzative e imprese rete*, Angeli, Milan, 1995, 1-250; The transformation of the 1980s: the growth of network companies, or the return of flexibility in large business?, *International Journal of Technology Management*, nov., vol. 9, (1993); The Shaping of New Technologies and the Social Innovation of learning, *Artificial Intelligence and Society*, vol. 8, n. 3 (1994); Local Systems, Industrial Districts, and Institutional Networks: Towards a New Evolutionary Paradigm of Industrial Economics?, *European Planning Studies*, vol. 4, n. 1, 21, (1996); Belussi F. and F. Garibaldi, Variety of Pattern of the Post-Fordist Economy, *Futures*, vol. 28, n. 2, (1996); Belussi F. and Arcangeli F. A Typology of Networks: flexible and evolutionary firms, *Research Policy*, 27, (1998).

**Abstract:** This paper studies the genesis and growth of two Italian industrial districts specialised in leather upholstered furniture. The first is of recent formation and is located on the border between two regions, Basilicata and Puglia, in the South of Italy. The second, which began during 1970s, is based in Emilia-Romagna in the area around Forlì. Both are specialised in upholstered furniture: sofas, armchairs, and others small items related to these products. The Forlì case resembles the typical Marshallian district, where, over time, a local system of small-specialised producers has formed. The case of Forlì represents a typical path dependent process. Here, a certain industrial structure, once favourable conditions have allowed it to emerge, has tended to reproduce itself, following over time the same pattern of interactions. Low levels of learning among firms is found. They use the local knowledge, historically produced within the area with little absorption and elaboration of external knowledge. On the contrary, the case of Matera-Altamura-Santeramo represents a quite new agglomeration in a rapidly growing industrial networks, made up of large and medium size units, in which firms have activated a process of creation of new contextual (and localised) technical knowledge. Here local firms show a notable propensity toward generative learning (new knowledge is absorbed from the outside and combined with the existing local knowledge). Obviously, not all firms in the district are innovative, but a few of them are (particularly certain dominant final firms that head large production networks). While agent

**proximity favours imitative behaviours, over time, the propagation of knowledge in Forlì has socialised craft-based skills. In contrast, in Matera-Altamura-Santeramo, the existence of a Schumpeterian-driven process, has accelerated the diffusion of new knowledge, stressing the dynamics of an endogenous growth process internally generated by knowledgeable entrepreneurs. A thick network of hierarchical firms has worked as an accelerator of technical change.**

Key words: path dependency, industrial districts, endogeneous growth, knowledge generation.

## **1. Introduction**

This paper studies the genesis and growth of two Italian industrial districts specialised in leather upholstered furniture. The first is of recent formation and is located on the border between two regions, Basilicata and Puglia, in the South of Italy. This new industrial district, whose development only became evident in 1990s, has developed in the territory around the municipalities of Matera-Altamura-Santeramo.

The second, which began during 1970s, is based in Emilia-Romagna in the area around Forlì. Both are specialised in upholstered furniture: sofas, armchairs, and others small items related to these products, such as end tables, lamps, frames for sofa-beds, mattresses, and the like.

In both cases, the principal product manufactured by local firms are made of leather, but, frequently, firms include in their production lines also sofas (or armchairs) in different styles (classic and modern), and in different fabrics (cotton, alcantara, velvet, floral or striped material). The Forlì case resemble the typical Marshallian district, where, over time, a local system of small-specialised producers has formed. On the contrary, the case of Matera-Altamura-Santeramo represents a quite new agglomeration in a rapidly growing industrial networks, made up of large and medium size units, in which firms have activated a process of creation of new contextual (and localised) technical knowledge.

The former describes an evolutionary pattern of an industrial cluster where the initial (embedded in the territory) expertise and skills were socialised and increased through bounded forms of learning. The latter is an industrial cluster in which firms have developed their original expertise, by mixing old and new forms of knowledge, resulting generative (creative) forms of learning.

The cases analysed represent two ideal types of industrial districts. In the first case, the already existing craftsmanship related to upholstering correlate to a path-dependent process of industry formation. So, the structural evolution of the local industrial structure is heavily dependent on the “initial conditions” of firms and agents [1, 2]. The path-dependent process trap firms in a stationary state. This became evident, particularly in

the 1990s, when local firms were not able to change and adapt their organisational structure to new organisational models implemented by rival firms in the district of Matera-Altamura-Santeramo. And they were not able to use new information and communication technology creatively, which appears to be the case of other Italian districts, such as Prato or Carpi.

In the second district, the evolution of the Matera-Altamura-Santeramo industrial structure, may be depicted as a case where local-contextual knowledge has been continuously up-graded, and the district, as a whole, has entered into a dramatic phase of growth. Building upon their original capabilities (upholstery skills), firms have activated processes for absorption of external knowledge. The external knowledge assimilated from outside has been combined with new bits of knowledge, generated by the principal firms of the district, within their product engineering departments. Very innovative leading firms have emerged, and this has disrupted the previously existing industrial structure, creating a continual industrial dynamic. Schumpeterian (radically innovative) firms have broken the equilibrium of uniformity in the local industrial structure, by participating in highly competitive networks [3].

The empirical work conducted by the research group directed by the author<sup>1</sup> has allowed us to highlight the sources of the existing diversity between the two local systems.

In particular, the variables on which we have focused, during the interviews organised within the field work stage, are the following:

- a) the origin of productive knowledge that the actors had access to during the initial stage of formation of the district;
- b) the modality of absorption and creation of new knowledge;
- c) the evolution of the local industrial structure;
- d) the extent of the inter-firm division of labour and the morphology of firms production networks (number of links, type of relationships, level of co-operation);
- e) the relationships of firms with their markets;
- f) the identification of product characteristics;
- g) the role played by local institutions.

At a more abstract level two important theoretical references have guided the plan of our research work.

Our first aim was to link the heterogeneity existing between the systems to the heterogeneity of the actors which constitute them, going from macro-structures [7] to micro, and vice versa. To what extent is the performance of industrial districts influenced by the behaviour of particular strategic individual firms? To what extent is the pattern of individual firms

---

<sup>1</sup> This article is based on a paper presented at the conference "La molteplicità dei modelli di sviluppo" November, 1997, at the University of Parma. The empirical research work has been conducted within the Adapt project "Learning Regions" organised by Ires Nazionale (see [4, 5]). A first version of the paper is on Belussi and Bertini [6].

constrained by the existing external environment? This goes back to the study of the influence of local proximity in modifying the channels and the direction of transfer, absorption and diffusion of information and knowledge. The variability of firms and the existence of *firm-specific* expertise define the field of research of evolutionary economics [8, 9, 10, 11, 12, 13, 14]. However, this field has been scarcely explored, with a few exceptions in the study of convergence/divergence in local territorial systems [15, 16, 17, 18]. Second, this essay, not only provides a well documented description of the two local production systems analysed, but it investigates the significance and importance of tacit knowledge in guiding firms and district dynamics [19]. The analytical model uses the work of Nonaka e Takeuchi [20] as its starting-point, which introduces an interesting schema of the circular flows activated between firms and their external environment for the exchange (transfer) and production of tacit and codified knowledge<sup>2</sup>.

## 2. A stationary district: Forlì<sup>3</sup>

The sector of upholstered furniture is located in the area of a few towns, within the province of Forlì-Cesena, all near the provincial seat of (the towns involved are: Meldola, Predappio, Bertinoro, Castrocaro, Forlimpopoli, and Civitella).

The furniture sector is concentrated right around the provincial seat,<sup>4</sup> where the economic complexity and the importance of public and private tertiary activities is greater than in outlying areas. Therefore, the furniture sector is an important local speciality which coexists with the other productive activities of the area. The local system of upholstered furniture in Forlì is not identified with a particular socio-economic reality as occurs in more classical industrial districts.

The upholstered furniture sector in Forlì has many of the characteristic traits of spontaneous local development: the firms in the area are completely “indigenous” and they have developed over time through “local gemmation ” [35]. The initial technical competencies, necessary for

---

<sup>2</sup> On this topic the literature is very extensive [see for instance 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34].

<sup>3</sup> The analysis of the Forlì case is based on the work of Bertini [see also 6].

<sup>4</sup> By using methodologically rigid defining criteria (like those described by F. Sfoza [36] and for the most part used in the application of article 36 of law 317), the sector of the upholstered furniture of Forlì can not be defined as an “industrial district”. In the province of Forlì-Cesena, the people active in furniture sector are only about 10% of the total in industrial manufacturing (excluding construction). This sector, for employment, is much less important than engineering, textiles-garments-shoes, and food processing. The persons employed in manufacturing industry together are about 26% of total employment outside agriculture according to the last census.

the development of the sector, were found in the craft area, within the activity of upholstery.

Despite the relatively small size of the firms and total employment, Forlì and its surroundings account for about 20% of Italian exports in this sector. The typical product of Forlì is a sofa with very thick leather. It is a system which has a sufficiently differentiated firms, with many externalities, and “economies of scale on the system level”. The local industrial structure is made up of many small firms and the extent of inter-firm division of labour is very high (see tab. 1). A significant level of cooperation exists among the various armchair suppliers and subcontractors with the final firms. About 240 firms belong to the upholstered furniture sector in Forlì. The existing 122 armchair makers are all independent producers. The development of the district has been characterised by a gradual expansion until the 1980s. During 1980s, despite a strong trend in firm natality, employment levels have started to decline, and many firms have closed. In recent years, the decline has been significant, especially in relation to the loss of jobs (the district has lost about 15% of its employment). However, the high rates of firm start up reveal a process of fragmentation of the industrial structure rather than a consistent mobilisation of entrepreneurial capacities.

## 2.1 The size of the industrial structure

The local filieré, described in Tab. 1, is made up by 239 firms and 2,780 employees. Strictly speaking, only half of them (122 firms) are involved in the final phase of production, being, thus, considered producers of upholstery (poltronifici). The remaining 117 firms form a vast layer of intermediate producers (and manufacturers of components). 85 firms work in the area as direct subcontractors (in the phases in which the cycle is divisible)<sup>5</sup>. 32 in the area of suppliers of accessories (mattress and mattress frames). If we include induced activities (transport, retailers, designers, and sellers of machinery), total employment reaches 3,135 employees.

Employment in final firms covers 66% (1,850 employees) of the total filieré, but only 59% of the “enlarged” filieré. Considering the enlarged filieré, the importance of subcontractors, in occupational terms is 25% of total employment (of the remainder 4% is employed by suppliers of accessories, and 12% in the activities of services).

---

<sup>5</sup> The production cycle of upholstery starts from the design of the model (which regard both the final shape, and the “explosion” of calculus for all sub-components). On the basis of the model, one has to prepare the internal structure (in wood or metal), and the cutting of the polyurethane for the internal parts. Then the cut parts are belted on to the structure, and prepared with a white covering. At this point there is the final assembly and covering with (fabric or leather), and mounting its legs. The covering, in order to be mounted must be cut and sowed in advance. The production of upholstery is apparently very simple and based on staple production, but we must bear in mind that it requires the assembly of many different sub-components, produced with very different technologies, and coming from disparate sectors (lumber, mechanical, secondary chemical, and textile-clothing). So, in the end, it involves a certain degree of complexity, and it must blend different skills.

From our research a good estimate of the total output in the enlarged filieré was about 700 billion<sup>6</sup> Italian lira in 1997.

An analysis of Tab. 2 demonstrates how the Forlì district is articulated. There is a large number of craftsmen, a predominance of small units<sup>7</sup> (only three firms surpass the threshold of 50 employees), a high level fragmentation in the structure of subcontracting. These data confirm the image of a typical industrial district: highly decentralised and rich in individual entrepreneurship, sustained by a social context which has developed collective factors of efficiency (social capital). The firms are not managerial, but have a simple structure which are normally family run. Tab. 3 shows that there are cases of evolution towards more complex group structures, but they are limited. However, the typical firm of the district (202 out of 239) are still represented by independent producers. This system has demonstrated a horizontal expansion, and firms entering the sector during the last decade (Tab. 4) were mostly imitative producers.

The power structure and the level of hierarchisation of the district is quite flat. Historically, no single firm has played a dominant role. One has to consider also that the historical founder of the district, the “incubator firm” Spazzoli, has never become a dominant producer, and is now a marginal presence. The industrial structure of Forlì is formed by first generation entrepreneurs, with strong personalities, and adequate technical competencies, but limited managerial skills. Generally speaking, they possess little control of final demand. Also the largest firm of the district sells its annual production capacity to a French buyer of a large chain. Many final firms of the district do not sell directly. Their outlets are controlled by commercial groups of buyers.

To sum up, all things considered, the model of production found in the district, and the firm organisational routines, are nearer to traditional craftsmen. This area, although rich of entrepreneurship, has not been able to express either leading figures, nor particular innovations in the field of production or product design.

**Tab. 1**

**The firms of the upholstered furniture sector in Forlì**

	FIRMS	ESTIMATES EMPLOYEES
ARMCHAIR MAKERS	122	1.850
SPECIFIC SUPPLIERS	75	790
Producers of wooden supports and bases	33	280

<sup>6</sup> It has been calculated that, in recent years, about 60% of the output of the district has been exported. The yearbook of exporting firms, published by the local Chamber of Commerce, mentions 50 firms of the district as exporters (about 40% of the final firms inserted in Tab. 1).

<sup>7</sup> In the case of upholstered furniture in Forlì, small size firms remain small even if evaluated by their strategic ability. In terms of their economic structure a quarter of the firms are individually owned, and half are partnerships, and so only 25% are limited liability companies. Then, if examined in terms of its capitalisation the weakness of the system becomes even clearer; only 3% of the firm have capital over 500 million and only 10% over 100 million; and over three quarters of the firms have less than 30 million [37]. This means that the firms have limited investment capacities.

Leather cutters	2	3
Sewing and tailoring	21	120
Belt makers	3	7
Foamed polyurethane work pre-upholstery (messa in bianco)	18	300
EXTENDED SUPPLIERS	8	80
Producers of metal supports and frames	32	140
Plastic work	11	50
Mattress producers	2	20
TOTAL	19	70
TOTAL	239	2.780
OTHER ACTIVITIES OF THE SECTOR (ESTIMATED)	75	355
Transport	70	110
Sales, models, catalogues, design	n.a.	200
Sewing machines and equipment	5	45

Source: archive of Associazioni di Forlì-Cesena, checked against INPS data.

**Tab. 2**  
**Firm size**

	1-5	6-9	10-19	20-49	50-99	> 100	TOTAL
ARMCHAIR MAKERS	38	26	39	16	2	1	122
SPECIFIC SUPPLIERS	42	20	17	5	1		85
Producers of wooden supports and bases	13	9	9	2			33
Leather cutters	2						2
Sewing and tailoring	18	2		1			21
Belt makers	3						3
Foamed polyurethane work pre-upholstery (messa in bianco)	3	4	8	2	1		18
	3	5					8
EXTENDED SUPPLIERS	22	7	2	1			32
Producers of metal supports and frames	6	4	1				11
Plastic work	1		1				2
Mattress producers	15	3		1			19
TOTAL	102	53	58	22	3	1	239

Source: archive of Associazioni di Forlì-Cesena, checked against INPS data.

**Tab. 3**  
**Form of firm direction**

	ARMCHAIR MAKERS	SUPPLIERS
Leading firm of formal groups		1
Leading firm of informal groups	5	
Firms controlled wholly/in part by formal groups		2
Firms controlled wholly/in part by informal groups	9	20
Independent firms	108	94
	122	117

Source: Direct investigation, and the archive of Associazioni di Forlì-Cesena, checked against INPS data.

**Tab. 4**

**Year of establishment of firms included in the INPS archive**

	BEFORE 1970	1971-1980	1981-1990	AFTER 1990
ARMCHAIR MAKERS	2	22	56	30
Suppliers	1	7	22	20
Producers of wooden supports and bases	1	3	9	5
Leather cutters				1
Sewing and tailoring		1	7	13
Foamed polyurethane work		3	5	
Plastic work for sofas			1	1
TOTAL	3	29	78	50

(\*\*) I INPS data using the date of the latest transformation of the firm as the date of establishment. The data in this table are therefore inflated for recent years and deflated in earlier years. Source: INPS.

### **3 The formation of the district: the mobilisation of contextual knowledge within a process of firm gemmation**

Upholstering in the post-war period existed in the province on a level of a craft and lacked an independent manufacturing basis. Real production of upholstered furniture on an industrial scale began when three craftsmen joined together in the 50s, however they still partially served the local market. Later, the three split up, and one of them, Spazzoli, established a firm that would become the originator of the district, who saw the opportunity to serve the national market and promoted his products through a chain of retailers.

Within the Spazzoli company they perfected the production techniques necessary to make leather sofas of a rather high quality which were seen by consumers as a handmade product of prestige. The skill in leather working were based upon the expertise which already existed in the shoe manufacturing and applied it to the new product.

During 1960s and 1970s, many groups of workers and technicians left Spazzoli and founded their own firms. Spazzoli was the firm which drove the Forlì system. The company was the prime mover of local entrepreneurship and was the place where the tacit and codified expertise for the production of upholstered furniture was recombined and elaborated creating the typical product of Forlì: a leather living room set which is very durable thanks to the thickness of the leather used (in Forlì they adapted the shoe-making machines to sew the leather coverings of the living room set).

The first two imitators in this sector were naturally two former partners of Mr Spazzoli [37].

At that time all the production phases were organised internally, and the firms were very small. In the 60s the phenomenon of spin-offs was quite limited. In any case, they tended to replicate the same model of the existing firm, as well as, the organisational routines of the “mother-firm” (for example, the armchair maker, Leoni di Meldola).

The proliferation of firms and the exit of entrepreneurship noticeably intensified in the 70s, the decade which can be seen as the real birth of the “district” of upholstered furniture in Forlì. Even today 77% of the firms in the sector were founded after 1971. (Tab. 4). During the 1980s, a process of firm restructuring began. Some were down-sized or folded (such as the armchair maker, Leoni). The major firms did not initiate a significant process of production decentralisation, but the firms which were established in those years were flexible and in a certain sense unorganised as a winning trait to deal with the unpredictability of the market. Naturally this quest for flexibility and adaptability product subcontracting firms specialised on specific phases and intense co-operative relations with sub-suppliers. The penetration of foreign market began at the end of 1970s, but it did not have much influence on the structure of the district [37, 38, 39].

## **2.2 The spread of the existing stock of knowledge and limited generative learning**

The manner in which the productive system of the Forlì upholstered furniture has developed replicates features often seen in Italy in relation to the formation of Industrial districts [40]. On the basis of this analysis and our historical reconstruction of how the system was formed, we can list its principal features.

First of all the role of local demand in the creation of a specialised upholstery craft network should be noted. The rising local demand for furniture created the conditions that favoured the growth of the trade of upholsterer which lies at basis of the system.

Another and successive feature was the ease of appropriation of the knowledge because of their low technological sophistication and the fragmentation of the productive cycle. It needs to be remembered that the sector is still highly skill-intensive, especially in regard to the working and cutting of the leather and the upholstering. These activities of the production cycle have the characteristic features of crafts, that is, they are tied to know how, to accumulated experience developed by practising the trade, and learning the secrets and tricks tied to making upholstered furniture. Workers learn their trade bit by bit, by working alongside more expert workers. The existing pool of knowledge is sustained and nourished by the development of tacit knowledge within factories. An institutional transfer of knowledge to new workers is organised within the production process. The creation of contextual, and practical knowledge, is at the basis of the process of new firm start-ups. The most expert workers can be rapidly transformed into competitors of the firm in which they previously worked. The divisibility of the production cycle further facilitates the entry of new entrepreneurs. They can limit, from the beginning, the firm's risk by specialising in one or a small number of production phases and then developing external networks of collaborators.

Another feature is the rapid diffusion of information and knowledge. Within the typical Marshallian district information circulates more quickly. Information about the sector or about market opportunities circulate along informal and uncontrolled paths: collaboration between firms that have relationships with sub-suppliers, the movement of workers from one firm to another, or through contacts with sales persons. From sales personnel and clients critical information on competitors is gained that can be rapidly translated into improvements in production and new products, thanks to their

experience with and knowledge of production techniques. A positive effect comes from the exchange of experience of the sector with that of other sectors; entrepreneurs who have previous experience in engineering, for example, have a greater aptitude for finding new technical solutions for certain problems in the production process.

It should be noted that from the experience of this local system, the generation and propagation of knowledge is based primarily on tacit knowledge and a process of socialisation of this knowledge within the district between key figures of the sector (skilled workers, technicians, sales persons), who have dominated the process of forming new firms.

Organised forms for the creation and propagation of codified knowledge are practically absent (technical training schools, experimental centres for applying new technologies, service centres). Therefore we are dealing with a development of direct and continuous learning in the field, and the predominantly informal exchange of information in the local environment. Institutions and associations, despite having played a role in some ways (for the improvement of quality, for example), have had basically a weak role, mainly in facilitating the development of entrepreneurs by reducing the material and immaterial barriers to the formation of new firms in the sector.

### **3.1 A thick network of hierarchical firms as an accelerator of technical change: the triangle of Matera-Altamura -Santeramo**

The triangle of upholstery furniture, located in the area including the towns of Matera, Santeramo and Altamura form the most important centre in Italy for the production of upholstered leather furniture (with about 2,000 billion Lira in sales, which represents more than 50% of the total national production [41, 42]). This area, furthermore, is the first industrial district born in the South and represents the endogenous potential of the local economy.

The local system appears to have been led by the leading firm, Natuzzi, that has propagated in the surrounding areas the model of innovation it established in the 80s. Later however, the growth of the system has given rise to more articulated leadership and to numerous organisational and production variations. This district is currently dominated by three large production networks which are based on some of the older founders: Natuzzi, Nicoletti and Calia. In 1997 the production of the three largest firms had reached about 1000 billion liras, which is half of the total sales of the district.

The production levels situated in the Murge has now “surpassed” the production levels of the district Forlì upholstered furniture, gaining on the system of Brianza and the industry spread over Veneto [43].

What are the reasons for their success? Certainly the initial stimulus came from the leading local firm. In leather upholstery furniture Natuzzi has become the leading European firm. Currently it supplies 20% of the American and 5% of the European markets. In Italy it has recently invested in a network of franchised outlets (totalling 69 shops) “Divani & Divani” and in diversifying its products (traditional living rooms with cloth upholstery and wood trim). Natuzzi has invested heavily in offering a wide range of choices (200 different colours and 26 kinds of leather for 300 different models as compared to 3 models in 3 colours of the German competitors). In leather they have introduced a new pastel nuance that clearly recalls the “Benetton model”. Since midway through the 80s the Natuzzi’s growth has been dizzying (e.g. in 1985: 147 employees; in 1990: 1,349; in 1996: 3,063). But along with the leading firm the “district” has grown and associated firms have become stronger. It is interesting to that the firm-network model has once again proved winning, within a typically Marshallian and spatially well-defined district. There has been no conflict then between the network firm and the industrial district model. Furthermore, the success of this district is bound to the adoption, or “invention”, of post-Fordist organisational methods even by its small firms. Recent development seem to have reached “tumultuous” levels. From our empirical investigation, it has emerged that in the next future years all major firms of the area will start training programs for hiring new workers. These initiatives has been strongly supported, for the first time, by public policy (the region and the EU)<sup>8</sup>. To be brief in the coming years it has been forecast that the more dynamic firms will create 6,400 to 8,400 new jobs directly and about 2,000 to 3,000 indirectly. To these the growth of the rest of the productive fabric should be added.

### 3.2 The size of the industrial structure

In 1997 the district<sup>9</sup> was formed by about 400 firms (43 near Matera and about 190 around Altamura-Santeramo, administratively under the jurisdiction of Bari), with the employment of nearly 8,000 workers (Tab. 5). If to this is added a prudent estimate of “submerged” employees (2,000 jobs) and of induced economic activity (1,000 jobs), one could estimate that the

---

<sup>8</sup> Calia through CEDEF will train 525 unemployed workers in Lucania in 1997 (it is predicted that at least 40%, that is 200 people, will be hired by the firm). Flep through Divania through the financing of law 488/92 predicts 250 new jobs (a doubling of sales from 80 to 150 billion). Interline Italia in Gravina di Puglia (Ba), intends to build a new plant, financed with subsidies from the region with 250 new jobs in Poggio Orsini. Nicoletti plans increased investment (financed through law 488/92) of 16 billion with about 400 new workers. The titanic plan of Natuzzi predicts by the year 2000 a doubling of sales (from 1,000 to 2,000 billion), with the hiring of between 5000-7.000 persons.

<sup>9</sup> Currently the “triangle of living room furniture” has spread to new areas, such as Gravina di Puglia, Bitonto, and Modugno nearly reaching Bari.

district gives work to 11,000 people. From interviews (which analysed 40 cases), the phenomenon of the creation of new firms has intensified in recent years (Tab. 7). In addition the district appears to be formed by a significant number of leading firms (Tab. 6), with only one formal group (the Natuzzi group), along with informal groups (11 firms) as well as independent firms from the proprietary status.

The number of final firms in the Matera-Altamura-Santeramo district is very similar to that in Forlì. In the area 124 producers of upholstery operate. However, their importance for employment is much greater: nearly 6,000 workers, representing the 76% of the total estimated filieré (which does not include service such as design, transport, and maintenance machinery). Looking at the size of the firms, we find 23 firms in the larger category (more than 50 employees). The average firm size, in Matera-Altamura-Santeramo is, in fact, 47 as opposed to 15 workers in Forlì. Here, the industrial structure of the district is formed by a thick network of hierarchical firms. The inter-firm division of labour is extended, as in Forlì, but firms' production cycles are less divided. Interestingly, also the average size of suppliers and specialised subcontractors is larger, often formed by firms employing with between 10-49 employees. The empirical analysis has shown that external suppliers (especially in wood and polyurethane cutting) are technologically more advanced in Matera-Altamura-Santeramo than in Forlì. In addition to that, in many firms we found that all activities were very integrated, obviously not in just one large "Fordist" unit, but within the firms' informal production networks. It may be noteworthy that the largest firm of the district (Natuzzi) owns three firms upstream from the cycle of upholstery: one unit in Naples for the production of polyurethane, and two units for tanning (one in the tanning district of Arzignano-Montecchio in the Veneto region, and one in Friuli-Venezia Giulia). This up-stream integration strategy has been used by Nicoletti and Calia, the two largest dominant groups after Natuzzi as well.

In contrast with Forlì, many phases of the production cycle have been re-arranged. Within firms, the phase of cutting is often combined with sewing, and the production of the internal supports (typically wooden) is combined with the preparation for upholstering. When the assembly phase (upholstering) is decentralised by final producers, subcontractors are supervised and controlled by the mother firm (through operational flow charts, in which the tacit knowledge that is "still in the air" in Forlì, is precisely codified here). The subcontractor must follow the accurate product specifications he receives (very often he has had worked in the firm from which he now receives orders) and all sub-components are provided by the final firms. The cognitive division of labour below has emerged in the district:

- a. Higher levels of knowledge are possessed by final firms which perform the design phase, and establish the organisation of the cycle, and retain responsibility for the final control,
- b. Assembly subcontractors do not possess design and marketing abilities. However, within a district where transaction costs are reduced, they operate at a higher level of production efficiency

- (low organisational costs and higher intensification of the pace of work),
- c. Specialised subcontractors (wood, polyurethane cutting, matts frames, mattress, and base producers) may enjoy certain scale economies because they work contemporarely for many final firms.

**Tab. 5 The Matera-Altamura-Santeramo upholstery district**

	Firm Size								Total:	Tot. employees
	1-5	6-9	10-19	20-49	50-99	100-199	200-499	>500		
Mattress and mattress frame producers	3	1	1	4					9	242
Living room furniture	31	13	22	35	10	6	6	1	124	5.838
Leather cutters	1		2						3	2
Producers of wooden supports	37	13	10	12					72	695
Leather cutting	3	2	6	10	2				23	577
Services				1			1		2	338
<b>Total:</b>	<b>75</b>	<b>29</b>	<b>41</b>	<b>62</b>	<b>12</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>233</b>	<b>7692</b>

**Source: our elaboration of Inps data**

**Tab. 6 Proprietary structure of a selected sample of the Matera-Altamura-Santeramo district**

	Firm Size							Total	
	0-5	6-19	20-49	50-99	100-499	>500			
Leading firms				2	3	6	1	12	
Belonging to a group								0	
Belonging to an informal group			2	2	1			5	
Independent firms			6	7	6	4		23	
								0	
								0	
<b>Total firms:</b>			<b>6</b>	<b>9</b>	<b>10</b>	<b>8</b>	<b>6</b>	<b>1</b>	<b>40</b>
<b>Employees:</b>			<b>10</b>	<b>101</b>	<b>289</b>	<b>574</b>	<b>1800</b>	<b>3300</b>	<b>6074</b>

**Sources: interviews**

**Tab. 7 Year of foundation of a selected sample of firms of the Matera-Altamura-Santeramo district**

	Firm Size						
	0-5	6-19	20-49	50-99	100-499	>500	Total:
1950-60					1	1	2

1960-70			1				1
1970-80	1			2	4		7
1980-90	2	6	3	4	1		16
> 1990	3	3	6	2			14
							0
Total:	6	9	10	8	6	1	40
Employees:	10	101	289	574	1800	3300	6074

---

**Source: interviews**

In the Matera-Altamura-Santeramo district, mainly it is the larger final firms that carry out innovative activity (in both product and process technology). By relating innovation and firm performance, it is significant to observe that during 1990s all major firms have had very high rate of growth, even if international markets have been very volatile. (Between 1994 and 1997, in our sample of firms employment levels grew of 56%!).

### **3.3 The formation of the district through the gemmation of firms and the diffusion of contextual knowledge**

The origin of this productive system occurred between '60s and '70s, due to the existence of local craftsmanship represented by about 100 upholsterers, if we sum the productive potential of a vast territory along a line from Matera through Altamura toward Bari [44, 45]. This sector chiefly served local markets and the needs of families in the areas of Puglia, Lucania and Calabria. The typical product manufactured for this market was of poor quality: a colourfully upholstered simple, three-seat sofa.

In this area the upholstery tradition had developed primarily in Altamura, an ancient fortress of the kingdom of Frederick II. Since ancient times Altamura has had a tradition of craftsmanship, it was site of a university under the Kingdom of Naples, and its population boasts of its fame for hard work which contradicts numerous prejudices about Southern Italy. In Altamura the upholstering sector was consolidated by establishment of the first industrial firms: Al.pa. (founded in 1955), Rocco Ferri and Ti.Esse (founded in the early 60s) of Giuseppe Tirelli.

Along side them there is an undergrowth of small semi-legal firms, which exploit 'black' labour and child labour. The Alpa firm can be considered the founding firm and "incubator" of the district even if almost simultaneously, in the early '70s Natuzzi, Calia and Nicoletti, began to produce living rooms around Matera.

The specific skills of these entrepreneurs, who for any years worked side by side, originate in the same trade of upholstery. Natuzzi began to work as apprentice in Bari in a woodworking firm, he opened a small upholstery

shop in Taranto afterwards and becomes salesman for the sofa chain of Chateau d'Ax then, a large firm in Brianza. In this manner he acquired important and highly specific commercial expertise for the later growth of his firm. At the end of the 60s Natuzzi began to produce upholstery furniture in the neighbourhood of "Serritiello la Valle" in Matera: among his employees were the nucleus of entrepreneurs that they later gave birth to the district. At the beginning his market was very small<sup>10</sup>. The beginning was very difficult as it was logical to expect in such an impenetrable and nearly an hostile environment to development as the South. The growth of the firm was not until later, in the first years the Natuzzi risked bankruptcy more than once.<sup>11</sup>

Until 1973 Natuzzi worked in Matera in a small firm that became the forge entrepreneurship in the area. In that year, the firm was destroyed by a fire and Natuzzi established a new firm, ex-novo, in Santeramo del Colle (Ba), moving to another province, but only a few kilometres from where he initially founded. This new Natuzzi firm began by copying foreign pieces and making a low quality product, but which was distinguished by being the first furniture manufacturer in the area to industrialise production. In 1980 it had only 98 employees, by 1985 it was already a small firm employing 122.

The history of the Matera district took in the following form. Giuseppe Nicoletti and Vincenzo Calia, two qualified carpenters who worked for Natuzzi in 1973 decided not to follow him to Santeramo and they found a new firm in Matera. In the 1978 they split up and created two separate firms: the Nicoletti group and the Calia group.<sup>12</sup>

The real take-off of the district occurred in the early '80s (see Tab. 7). As Baculo [44] recently pointed out, it was a spontaneous development, not favoured by public policies which in those years was still financing cathedrals in the desert in the South.

In the beginning all the materials used were purchased in the North. But gradually local suppliers (wooden supports and padding in polyurethane foam) developed.

In these years specialised firms for wooden pieces and polyurethane were founded<sup>13</sup>. The spontaneous division of labour that occurred in the district increased network externalities, and accelerated the rate of adoption of technical change (newly created firms were equipped with modern and

---

<sup>10</sup> In area there are still those who remember when, after making a few pieces, Pasquale Natuzzi would personally load them into a pickup truck, and go to Calabria to sell them to small local merchants.

<sup>11</sup> Late payments by local merchants could create a critical financial situation at any time. Natuzzi's name even appeared in the list of persons with bad credit ratings.

<sup>12</sup> In 1977 Flep was founded in Bitonto (Ba): the founders were salesmen of leather and corduroy. In this case as well the original expertise came from Natuzzi the leading firm of the area where they worked initially. They began producing sofa-beds for the local market and later established themselves in the rich market of Saudi Arabia.

<sup>13</sup> For example in 1980 Polydac was founded by Nicoletti and Gabriele Draicchio, a mechanic from Matera who had worked in a Milanese firm that made moulds for poliurathane for furniture. Draicchio collaborated in his spare time in design firm in Veneto and went to Matera by chance to make a prototype for a sofa, where he met Nicoletti. This is how a positive productive collaboration began. The use of poliurathane is a technical innovation which is seldom used, especially in the South. Before that feathers and cotton batting were commonly used. All the upholstered furniture firms in the area began to use the new material. Polydac became the supplier of Natuzzi, Nicoletti, Calia and Musa (since 1980 about twenty firms in this sector have been founded).

technologically advanced machinery). In turn, this reduced the costs of parts for the final firms.

As has been established by the literature of industrial districts, labour market mobility is an important feature in reinforcing the spatial diffusion of practical knowledge. In the course of our study we found numerous supporting anecdotes. Sales personnel “emigrated” from Natuzzi to Calia (Mario di Troia, the former director of exports) and from Nicoletti<sup>14</sup>. But while in the Forlì case the diffusion of knowledge was mainly related to tacit skills and to practical knowledge and expertise acquired in the area, in the district of Matera-Altamura-Santeramo the physical proximity of knowledgeable actors (Natuzzi, Nicoletti and Calia) spread of higher levels of knowledge (new pieces of codified and tacit knowledge, generated, re-combined, and externalised by the leading firms).

In the 80s many small firms were born through the imitation. The “big” firms as well continually created new local units. This development was spontaneous and tended towards “invisibility”.<sup>15</sup>

Even though the press have given great (and exclusive) emphasis to the Natuzzi phenomenon, it would be wrong to reduce the living room furniture district’s productive complexity to just the leading firm. Other small firms created in the 80s now enjoy quite significant market autonomy on their own level: Ellele of Altamura, was founded in 1980 by a former worker of Alpa, one of the historic firms), partially acquired by Natuzzi in 1996, the Musa industrial group Spa, of Altamura (founded by former workers in small local firms), Piquattro of Iesce, founded by a former Natuzzi employee, Italdesign and Italconfort of Modugno, in the area of Bitonto (both former Natuzzi employees; Interline of Gravina di Puglia, etc.).

### **3.4 The acquisition of external knowledge (tacit and codified) and the recombination process**

In the early 80s local entrepreneurs began to become active in the national and international market. The district opened up both to acquire and adapt new technical knowledge and to participate in the global market: Matera’s entrepreneurs understood that the outlet for products in Italy were too fragmentary and sought out foreign buying groups that would allow them to make a more standardised product in large volume.

Minor and marginal producers still were active in the national market and through contacts made and the Bari trade fair of 1982, where for the first time Southern firms in the furniture sector were represented, they began to

---

<sup>14</sup> Until 1985-86 Nicoletti grew at about the same rate as Natuzzi. And it was Nicoletti to send the first container to the USA (a mishap with an American partner blocked the planned expansion).

<sup>15</sup> It developed in a non-industrialised area far from the danger of organised crime (in Altamura organised crime tried to take a “cut” in the 80s but the local firms formed an association, ASSOPIM, and resisted the blackmail). They adopted chicken coups and farm houses to produce sofas of parts of them, using atypical organizations and “black” work.

enter the national sales channels of the North. Then Matera's entrepreneurs began to systematically to be represented at the Milan trade fair along the largest firms, Businelli and Minoli, and the large retail chains. In this way a imitative process copying the models of the Northern firms, the sector leaders. The cost-cutting strategies adopted by local firms in the triangle of living room furniture began to erode the competitiveness of the firms of Brianza and Forlì.

The success of the district however must be attributed to the role of pathfinder played by the leading firm. The story told by Napolitano [46], is instructive on the causal chains of interactions from which generative learning may be activated [47]. In 1980 IASM organised for a group of Italian firms to participate in the Montreal trade fair in Canada. Natuzzi decided to participate but at the last moment the Italian exposition was denied. Natuzzi, who had already bought his plane ticket, decided to go to go anyway. After two hour at the fair, he understood what had to be done. Terrified by the idea of twiddling his thumbs for ten days, he bought a ticket for New York. In New York, he passed his time looking at the magnificent shop windows and discussing with clerk about how to import products from Italy [46]. The large price difference for leather sofas sold in Italy stuck him. In 1980 Pasquale Natuzzi began his American adventure and decided to export to the American market. An Italian-American distributor helped him (a buyer for Macy's). His first consignment for Bloomingdale's began with a model costing \$699 as opposed to \$1,999 for a similar model in the American market. To cut costs Natuzzi substituted the materials used for its frame (no longer in solid wood, but less costly white fir plywood panels) and reinvented a post-Fordist production organisation. The production cycle was divided in phases with the work times calculated in production minutes. The models were designed with an eye out for opportunities to simplify the industrial phases. In the organisation of his system's factory Natuzzi was inspired by Mercedes' assembly line for car seats he had seen in operation in Germany when he had tried to become a subcontractor of the car industry. The average production time necessary per seat was reduced to about 100-150 minutes (in Forlì it is about two times or more).

The innovations introduced by Natuzzi represent a continuous process of up-grading, with original recombinations of existing knowledge, new knowledge and existing tacit skills.

The commercial success of Natuzzi became a new productive model for local entrepreneurs to imitate. In the area knowledge of how to produce at lower costs were accumulated. The incremental innovations introduced and modifications in machinery have been numerous. In short, in loco a learning curve "agitated" by the leading firm has been activated but in which other local firms play an active part.

Natuzzi specifically is the successful entrepreneur (the innovator) who generated imitative behaviour in the local system (the creation of imitative firms).

Within the Matera-Altamura-Santeramo triangle tacit knowledge about the productive expertise necessary for the production of leather sofas (ranging from the technical know-how, to the relational know-who/what:

such as which technologies to acquire, which materials, where to find suppliers, etc.). If in Forlì the upholstery sector is still a craft, in Matera-Altamura-Santeramo it has become a technically advanced item, driven by logistic robots, designed by three-dimensional CADs, and engineered by technicians.

## 4.1 Conclusions

This article deals with the analysis of two industrial systems located in two very different economic contexts but that share the same production matrix: the manufacture of upholstered furniture.

To describe the dynamics of growth of these systems we have utilised the conceptual apparatus elaborated in the milieu of evolutionary economics which ranges from the followers of Schumpeter to the post-Keynesians institutionalists. These economists differentiate themselves from the neo-classical tradition, which is centred on concepts of optimisation, convergence and equilibrium (or stationary states), by addressing the problem of explaining economic dynamics and the spread of technological change. In a general sense, utilising a biological paradigm, evolutionary economics is seen as studying the processes of change and of selection of surviving in the population of firms. This deals with the emergence of organisational routines, learning models [48, 49], externalities and of spillover. In some economic local production systems this has accelerated the growth process [50]. This article emphasises the heterogeneity of the economic systems studied, and the great differences which exist among the firms in terms of product, of organisational models, and of expertise. This is not a commonplace observation. Variety of firms and the existence of firm-specific skills define the field of study of research in evolutionary economics [10, 14]. Statistical regularity may be found within of the various studies of industrial economics, which is not dependent on the existence of imperfect markets, as hypothesised by the neo-classical approach, but by endogenous and structural characteristics present within each productive structure [7]. They are indicative of the varied behaviour of economic agents: their innovative and organisational ability, their implementation of cost-cutting strategies, their choice of defensive or aggressive competitive strategies, which are indicated respectively by product differentiation, by marketing and sales policies, and by their relational and networking abilities [17].

This essay, besides furnishing a description of the two local productive systems, has tested the existence of an ample range of firm variety. It has also investigated the importance and characteristics of the tacit skills in the developmental dynamic of the firms. The analytical model used derives from the considerations of Nonaka and Takeuchi [20] which

introduced an interesting classification scheme on how cycles for the exchange and production of tacit and codified knowledge between firms and their economic external environment arise.

The idea behind this paper is to discuss not only the origins and sources of diversity among the individual economic units, but, on a more general level, to model the aggregate evolutionary patterns of two “similar” industrial clusters.

Considering the path dependent hypothesis, developed over the last decade among economists, which places the analysis of the joint evolution of industrial systems (and technologies) within the constraints of their initial path, our work demonstrates empirically how systems may evolve differently, and that even initial tendencies in expertise (a focus on craftsmanship) may be overcome. Thus, in some situations, there is path-dependency, but in others, an industrial dynamic is activated and an accelerated transition towards new paths has occurred.

The case of Forlì represents a typical path dependent process. Here, a certain industrial structure, once favourable conditions have allowed it to emerge, has tended to reproduce itself, following over time the same pattern of interactions. Low levels of learning among firms is found. They use the local knowledge, historically produced within the area with little absorption and elaboration of external knowledge.

Quite the opposite trend is found in the district of Matera-Altamura-Santeramo. Here local firms show a notable propensity toward generative learning (new knowledge is absorbed from the outside and combined with the existing local knowledge). Obviously, not all firms in the district are innovative, but a few of them are (particularly certain dominant final firms that head large production networks). While agent proximity favours imitative behaviours, over time, the propagation of new knowledge [51] has occurred only because at least a few agents were very innovative. So, as a whole, the entire stock of knowledge possessed by the local system has grown. In addition, the presence of network externalities has accelerated the dynamics of growth.

The choice of these two industrial districts does not permit us to make generalisations. We are still puzzled by the divergent trends. In our article, a path dependent process, which resembles, in some ways, the case of neo-classical stationary growth, has been contrasted with a Schumpeterian-driven process, which stresses the dynamics of an endogenous growth process, internally generated by knowledgeable entrepreneurs. Our article, in substance, empirically describes how two initially very similar local systems, made up of small firms with the same widespread expertise in the skills of the upholstery craft have evolved along very different routes.



## References

- [1] P. David, Clio and the economics of QWERTY, *American Economic Review*, 75, 2, (1985).
- [2] B. Arthur, Competing technologies, increasing returns and lock-in by historical events, *Economic Journal*, 99, (1989).
- [3] F. Belussi and F. Arcangeli, A typology of networks: flexible and evolutionary firms, *Research Policy*, 27, (1998), 415-428.
- [4] Adapt, Interviste alle imprese nei due sistemi locali del salotto, Ires, Roma. 1997.
- [5] G. Altieri., F. Belussi, and C. Oteri, La dinamica delle imprese e l'evoluzione e caratteristiche del mercato del lavoro nel distretto dell'imbottito, Ires nazionale, mimeo, 1998.
- [6] F. Belussi F and S. Bertini, Evoluzione, apprendimento e modelli di acquisizione delle conoscenze: due sistemi locali a confronto nel settore del mobile imbottito, *Economia e Società regionale*, 2, (1998), 74-93.
- [7] S. Breschi and F. Malerba, Sectoral innovation systems: technological regimes, schumpeterian dynamics, and spatial boundaries, in: Edquist C. (ed), *Systems of Innovation*, Pinter, Londra, 1997.
- [8] R. Nelson R. and S. Winter, *An Evolutionary Theory of Economic Change*, Harvard Univ. Press, Cambridge, Mass, 1982.
- [9] S. Winter, Knowledge and competences as strategic assets, in: D. Teece (ed), *The competitive challenge*, Cambridge Mass., Cambridge, 1987.
- [10] G. Dosi, Performances, interactions, and evolution in the theory of industrial organisation, in: A. Del Monte (ed), *Recent Developments in the Theory of Industrial Organisation*, Macmillan, London, 1992.
- [11] M. Zeleny, Knowledge as a new form of capital, *Human Systems management*, 8, 1989, 77-104
- [12] D. Teece and G. Pisano, The dynamic capabilities of firms: an introduction, *Industrial and Corporate Change*, 3, 1994.
- [13] R. Nelson, Recent Evolutionary theorizing about economic change, *Journal of Economic Literature*, 33, 1995.
- [14] C. Edquist, (ed), *Systems of Innovation*, Pinter, London, 1997.
- [15] G. Gottardi., Technology strategies and innovation without R&D *Journal of Industry Studies*, 2, December, 1996.

- [16] F. Cossentino, F. Pyke, W. Sengenberger, *Local and regional response to global pressure: the case of Italy and its industrial districts*, Ilo, Geneva, 1996.
- [17] S. Albertini. e L. Pilotti, *Reti di Reti*, Cedam, Padova, 1996.
- [18] L. Biggero, Italian industrial districts: an evolutionary and institutional view, New York University Working Paper, forthcoming, 1998.
- [19] F. Belussi and L. Pilotti, Knowledge creation and learning within the governance of the Italian local production systems, paper presented at the conference Hybrid governance forms, knowledge creation and technology transfer, Castellanza, 5-7 October 1998.
- [20] I. Nonaka and H. Takeuchi, *The Knowledge Creating Company*, Oxford Univ. Press, Oxford, 1995.
- [21] M. Polanyi, *Personal knowledge*, Routledge, London, 1958.
- [22] K. Imai., I. Nonaka, and H. Takeuchi, Managing the new production development, in: Clark K., Hayes R., (eds), *The Unease Alliance*, HBS Press, Boston, 1985.
- [23] S. Kline and N. Rosenberg, An overview of innovation, in: R. Landau and N. Rosenberg (eds), *The Positive Sum Strategy*, National Academic Press, Washington, 1986.
- [24] M. Gilbert and M. Cordey-Hayes, Understanding the process of knowledge transfer to achive successful technological innovation, *Technovation*, 16, (6), 1990, 301-312.
- [25] I. Nonaka, On a knowledge creating organisation, mimeo, paper presented at the Associazione nazionale Formatori, Parma, October 23th-30, 1993.
- [27] K. Arrow, The production and distribution of knowledge, in: G. Silverberg and L. Soete (eds), *The Economics of Growth and Technical Change*, Edward Elgar, Aldershot, 1994.
- [28] B. Lundvall and B. Johnson, The Learning Economy, *Industry Studies*, 1, (2), (1994), 23-42.
- [29] A. Arora and A. Gambardella, The changing technology of technological change: general and abstract knowledge and the division of innovative labour, *Research Policy*, 23, (1994), 523-53.
- [30] J. Senker, Tacit knowledge and models of innovation, *Industrial and Corporate Change*, 4, (2), (1995).
- [31] I. Nonaka, K. Umemoto, and D. Senoo, From information processing to knowldge creation: a papradigm shift in business management, *Technology in Society*, 18, (2), (1996), 203-218.

- [32] G. Becattini, and E. Rullani, local systems and global connections: the role of knowledge, in: F. Cossentino, F. Pyke, and W. Sengenberger, (eds), *Local regional response to global pressure: the case of Italy*, Geneva, Italy, 1996.
- [33] R. Cowan and D. Foray, The economics of codification and the diffusion of knowledge, *Industrial and Corporate Change*, 6, (3), (1997), 595-622.
- [34] C. Antonelli, *The Dynamics of Localised Technological Change*, Kluwer, Amsterdam, forthcoming, 1998.
- [35] F. Fauri, Lo sviluppo economico nella Provincia di Forlì, Università degli Studi di Bologna - Dipartimento di Scienze Economiche, Associazione degli Industriali della Provincia di Forlì-Cesena, 1994.
- [36] F. Sforzi, Sistemi locali di impresa e cambiamento industriale in Italia, Irpet, mimeo, 1995.
- [37] A. Bardi, *Il settore del mobile imbottito nell'area del Forlivese: un possibile distretto?*, Università degli Studi di Bologna - Facoltà di Scienze Politiche, dissertazione di laurea, 1996.
- [38] Camera di Commercio Industria Artigianato Agricoltura Forlì-Cesena, Import-Export Directory Forlì-Cesena Italy, CCIAA Forlì-Cesena,
- [39] L. Poma, T. Bagnoli, F. Ravaioli, *Sviluppo industriale e sviluppo territoriale nel Forlivese*, Università degli Studi di Bologna - Facoltà di Scienze Politiche, Fondazione Livio e Maria Garzanti, Forlì, 1996.
- [40] F. Belussi, Policies for the development of knowledge-intensive local production systems, *Cambridge Journal of Economics*, forthcoming, (1999).
- [41] CSIL, LIFE. *Analisi e proposte per lo sviluppo del mobile imbottito come sistema territoriale*, Comune di Forlì, 1997.
- [42] CSIL, *Le imprese artigiane nel settore del mobile imbottito*, CSIL, Milano, 1993.
- [43] PIMS & Associates, *Le strategie competitive del mobile imbottito*, Milano, 1993.
- [44] L. Baculo, (ed), *Impresa forte politica debole*, Edizioni Scientifiche Italiane, Naples, 1996.
- [45] G. Molinari, L'area sistema dei salotti della murgia, in: L. Baculo (ed), *Impresa forte politica debole*, Edizioni Scientifiche Italiane, Naples, 1996.
- [46] R. Napolitano, *Fatti per vincere*, Sperling&Kupfer Editori, Milan, 1996.

- [47] D. Lane, F. Malerba, L. Orsenigo, R. Maxfield, Choice and action, *Journal of Evolutionary Economics*, 6, (1996).
- [48] W. Cohen and D. Levinthal, Innovation and learning: the two faces of R&D, *Economic Journal*, 99, (1989).
- [49] W. Cohen and D. Levinthal, Absorptive capacity: a new perspective on learning and innovation, *Administrative Science Quarterly*, 35, (1990).
- [50] F. Belussi, Local production systems as accelerators of new technologies in the presence of network externalities, paper presentato al convegno, Market and Institutions", 12<sup>th</sup> June, Padua University, 1998.
- [51] E. von Hippel, *The Sources of Innovation*, Oxford Univ. Press, Oxford, 1988.