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Fiorenza Belussi, Silvia Rita Sedita. The evolution of the district model: ‘reverse relocation’ and the case of the leather-tanning district of Arzignano. *European Review of Industrial Economics and Policy*, 2010, 1. hal-03468671

**HAL Id: hal-03468671**

**<https://hal.science/hal-03468671v1>**

Submitted on 7 Dec 2021

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# The evolution of the district model: 'reverse relocation' and the case of the leather-tanning district of Arzignano

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This article has been originally published as:  
Fiorenza Belussi, Silvia Rita Sedita, 2008, L'evoluzione del  
modello distrettuale: la delocalizzazione inversa e il caso del  
distretto della concia di Arzignano, *Economia e Politica  
Industriale*, vol. 35, n. 2, p. 51-72.

## 1. Introduction

In this work we discuss the evolutionary paths of industrial districts. We describe a specific case which illustrates an 'anomalous' path but is nevertheless of interest, given its possible replicability in other district contexts.

In particular, we shall examine the evolutionary path of the tanning district of Arzignano, by analysing the results of an empirical survey conducted in 2005<sup>1</sup>. We shall dwell upon the reasons that have induced the majority of local actors to favour the developmental model which we call 'reverse relocation'. This phenomenon involves the large presence of immigrant workers and contrasts with the 1990s trend, whereby Italian districts relocated some manufacturing activities to countries with low labour costs. In Arzignano, currently, about one-third of the labour force in the district – 4,644 out of 12,000 employees – consists of recently immigrated workers. The survey showed that the deep local embeddedness of firms had dissuaded them from pursuing the path of international relocation. Instead, they have preferred to open the local labour market to non-EU workers (thereby solving problems connected with institutional hyper-rigidity). This case is emblematic, because it confirms the existence of different (more or less efficient and/or effective) strategies of

<sup>1</sup> The interviews were conducted by F. Belussi and E. Molina. The survey was conducted on a sample of 15 firms and 50 non-EU workers in the district. The methods used were face-to-face and telephone interviews, using a semi-structured questionnaire to entrepreneurs, senior managers, and employees.

globalisation. The choice of reverse relocation, as will be shown in what follows, can be considered a *second best* solution, because it does not yield a net reduction of costs as does relocation to low-wage countries (the *first best* solution).

Section 2 outlines the evolutionary trends of the district model, including the review of recent internationalisation processes and the illustration of the “reverse relocation” phenomenon. Section 3 describes the case of the leather-tanning Arzignano district, depicting its rise, consolidation, and evolution towards a hierarchical model, headed by leader firms, strongly embedded in the territory, and dominated by a “reverse relocation” internationalisation model. Section 4 offers some conclusive remarks.

## 2. The evolution of the district model

### 2.1 From the Marshallian to the evolutionary model

The literature on industrial districts since the seminal studies of Marshall (1919, 1920) has highlighted the institutional and social aspects which favour the embeddedness of social networks of small specialised firms (Maskell, 2001; Grabher, 1993; Sorenson, 2005), and the mechanism determining the division of labour among firms (Albertini and Pilotti, 1996; IPI, 2002).

This local system is characterised by the co-presence of cooperation and coordination within the various phases of the production chain, and by the existence of competitive relations among the local firms operating in the same phase of the production process (You and Wilkinson, 1994). This theoretical model assumes that the clustering process (Martin and Sunley, 2003) develops mainly in sectors able to benefit from the transmission and sharing of knowledge made possible by spatial proximity (Amin and Cohendet, 2000; Belussi and Pilotti, 2002; Loasby, 1998; 2000; Lombardi, 2000).

This process typifies: 1) sectors where the knowledge possessed by the various actors must constantly and flexibly be recombined (e.g. traditional sectors characterised by high fashion content), or 2) the sectors which benefit from knowledge spillovers deriving from local relationships with partners possessing highly specialised skills.

The former category comprises the canonical districts specialised in textiles and clothing, footwear, and mechanical engineering (Lazzeretti and Storai, 1999). The latter includes the high-tech/science districts located in

the United States or in Great Britain (Cooke, 2004; Feldman and Audretsch, 1999; Saxenian, 1994) specialised in biotechnologies, biomedical applications (Zeller, 2001), electronics, and software production.

In the standard conceptualisation of the industrial district, no particular strategies are attributed to local firms because it is assumed that organisational relationships are predominantly of horizontal type among atomistic firms (Baccarani and Golinelli, 1993, Paniccchia, 2002).

However, since the mid-1990s, the Italian districts have undergone an evolution (Markusen, 1996; Belussi et al., 2003) and a process of verticalisation (Lazerson and Lorenzoni, 1999) which have generated: a) more intense innovative activities in some firms (Cainelli and De Liso, 2005), b) a size growth of district firms, due to the formation of 'firms' groups' (Iacobucci, 2006), and c) the international relocation of many activities previously carried out by local sub-contractors (Guerrieri and Iammarino, 2001; Zucchella, 2006). Regarding the latter consequence it should be noted that the evolution of districts has followed a more general pattern of international fragmentation of production (Arndt and Kierzkowsky, 2001). This has often increased a district's internationalisation rate, through FDI and international subcontracting. The traditional model of the industrial district has, therefore, been radically transformed, following several development paths (Mariotti et al, 2006; Cainelli and De Liso, 2006). However, only certain canonical Marshallian districts have been transformed into evolved districts (Sammorra and Belussi, 2006).

## 2.2. The “reverse relocation” internationalisation model

The classic internationalisation pattern of Italian districts has mainly been of a mercantile type that is largely driven by exports. The participation of medium-to-large enterprises belonging to the more dynamic local systems in a broader *extra-district* division of labour through joint ventures, alliances and networks of international subcontractors represents a new developmental model. This new model is able to exploit the advantages accruing from the spatial differentiation of competitive conditions (environment, resources, costs, infrastructures, and knowledge). Thus there has been an objective convergence of the neo-district model with the global expansion of multinational companies (Bair and Gereffi 2001), with a consequent change in the dynamics of the relationship between

agglomeration economies and firms' internationalisation models (Caroli and Lipparini, 2002).

The leader firms of some Italian industrial districts have maintained their international competitiveness through the large-scale international outsourcing of labour-intensive manufacturing activities to underdeveloped nations with abundant low-cost labour. At times, this has involved the creation of foreign subsidiaries favouring the use of international investments. However, the high risks connected with this strategy are well known, given the financial exposure required to firms and the connected "liability of foreignness" (Zaheer, 1995)

Firms have most frequently used networks of international subcontractors (or created them *ex-novo*, building new networks of international subcontractors, comprising numerous other partner districts). This process has favoured the growth of 'satellite' districts, consisting mainly of foreign firms carrying out subcontracted work for firms located in Italian districts. Unlike the American case of the 1980s, based on the 'de-industrialisation', or that of Britain in the 1930s, which led to the irreversible decline of the textiles district of Lancashire, the international openness of the Italian districts operates within a diversified framework. Those firms which relocate do not exit permanently from the local system, nor do they close down, overwhelmed by competition from 'newcomers'. In the new economy of knowledge and 'networked capitalism', district firms have spatially reconfigured their value chains by activating a flow of activities with enterprises located in Eastern Europe and Asia.

Whereas the Marshallian theory conceived an industrial district as a 'self-contained' territorial area, of limited extension and comprising a myriad of small and medium-sized enterprises, where production was not typically concentrated in large factories, the Italian district of the 1990s became internationalised by transforming itself into a 'meta-district' governed by local globalised leading firms (Corò and Grandinetti, 1999; Mariotti et al, 2006).

The analysis of the relocation processes of district enterprises should not be restricted to the firm level. In fact, we must also determine the aggregate impact of those processes at the local level. The internationalisation of the Italian district has not entailed the outright abandonment of some historically-consolidated manufacturing specialisations, or of the so-called 'Made in Italy' sectors; rather, it has increased the diversification process and it has expanded the output of some incumbent leading firms. Carabelli et al (2006), studying the evolutionary dynamics of industrial districts, have

shown that tertiary and service activities are now predominant in districts; while the specialisation sector has changed in others. Some districts, in fact, have become producers of technologies: for example, the district of Vigevano switched from producing footwear to producing machines for footwear manufacture.

Amid the numerous evolutionary paths of the Italian industrial districts, an alternative pattern to relocation has been followed by a number of classic Marshallian districts, such as Prato (Becattini, 2003), or the contiguous Florentine area (Bortolotti, 1994), or the leather tanning district of Arzignano, near Vicenza. These districts have 'imported' workers and entrepreneurs from the low labour-cost countries.

Economic theory suggests that globalisation eliminates imbalances in growth rates and resource endowments in two ways: a) by developing international trade, and b) by moving production factors (labour and capital).

Flows of FDI and the migration of skilled workers from the underdeveloped countries appear to be interchangeable (Kluger and Rapoport, 2005). Migratory flows are often associated with the dynamics of international trade (Carbaugh, 2007). In the neoclassical paradigm, production factors are mobile, and it must be assumed that the economy will react to an imbalance in costs (related to labour and/or capital), or in the availability of some factors (abundance or shortage), by stimulating the migration of labour or capital. In the long term, the prices of the inputs will converge, reducing wage inequalities and capital endowments. In a simple "two-country model" with different development levels and different wage levels, international trade moves the goods between the two countries, according to the competitiveness of their firms, while if there is immigration, workers move from their countries of origin, following the supply of better salaries (or working conditions). Moreover, immigration into the more developed countries also stimulates higher import flows from developing countries necessary to satisfy the immigrant's demand of specific ethnic goods. If immigration takes place because wages in the developed country are higher than in developing countries, a surplus of labour supply in that country will be created, and, probably, in the long-term, a reduction in relative prices will occur.

This will discourage further immigration flows. Let us illustrate this process with the case of a country that has the lower wage levels. This country will benefit of a growth potential, because its export flows will increase. This will determine a growth in its labour demand, and

consequently in its wages. The incentive to leave the underdeveloped countries, thus, will diminish, also because of the reduction of the wage gap. In the end, under these stringent assumptions, convergences in the factors prices will happen, and, consequently, an alignment in the development levels. Hence, international trade and migration are substitutes <sup>2</sup>.

The same applies in the case of underdeveloped countries to the international flows of capital (in relation to the existence of a large availability of low cost labour) which attract foreign investments, when no international legal barriers are in place. If, for example, a district area approaches a situation of labour supply saturation (because the past development has absorbed all the available workers, or because the local population has raised its employment preferences and disdained factory work), it is likely that the local firms will use FDI to relocate their production activities where labour is more abundant and less costly. Obviously, in particular conditions, this may not be easy to achieve, because there may be impediments of a technical nature (for instance: some difficulties in the separability of the production process or the existence of local skills that would be costly to transfer), or of a social one (embeddedness of entrepreneurs). Consequently, it can be assumed that a second-best alternative is available, which consists in moving workers by encouraging migration from countries with low-cost and abundant labour supplies. Therefore, instead of moving capital, it is labour which is moved (even if it is employed in conditions of relatively higher costs than in the country of origin). It is predictable that for many years, until complete integration has been accomplished, foreign workers will be less expensive for firms. Initially they will not be unionised, and, in order to obtain a job

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<sup>2</sup> Of course, once we experience significant differences in the technological capacities and in the quality of resources, there will not be a perfect convergence via international trade. Instead, as analysed by Mundell (1957), there may only be a relative convergence in prices between developed and underdeveloped countries, but not the alignment of their economies. In fact, as discussed by Heckscher and Ohlin, in the theory of resources endowment, products incorporating a large amount of scarce resources in a country will be imported, while those that incorporate a large amount of resources available in that country will be exported. If there are important technological differences between two countries, international trade flows and migration of workers appear to be complement, not substitutes. The more the technologically dynamic countries reduce their costs, the more they export, offering better wages to workers coming from underdeveloped countries. Thus, they are in a position to absorb (or induce) migratory flows of workers from less developed countries (Markusen, 1983).

(and, therefore, an entry and stay permit), they will accept inferior working conditions.

*Push* factors are also important in explaining the process of immigration. They are motivated by the desire to improve income and living standards. In the United States and Europe, migration processes have traditionally been very intense (Trebilcock and Sudak, 2006), because the more developed countries have needed to reduce their labour demand gaps. Considering migration flows, unskilled labour is initially more attracted. Thereafter skilled workers also tend to migrate. This was the case, for instance, of the Asian computing programmers and engineers employed by companies in the Silicon Valley, in the California State, over the past twenty years<sup>3</sup>. The question of the complementarity or substitutability of international trade, FDI, and migratory flows has not yet been clarified in the international business literature (Federici and Giannetti, 2006).

In fact, behind some migratory flows, there are social and/or business networks that may stimulate the formation of strong ties between countries through *brain circulation*, the birth of new entrepreneurship, and inward and outward FDI flows, as discussed by Saxenian (2000).

The relocation processes of the 1990s show that, once the Italian district firms had overcome the system's inertia and rigidity, they preferred to bring capital to low-cost labour countries (for a survey see Belussi and Sammarra, 2009).

In a few other cases the selected pattern is more similar to that which emerged in the USA, and in Silicon Valley (Saxenian, 2000), which exhibits an intense labour mobility (from developing countries and towards developing countries, involving clusters or districts).

Bortolotti (1994) was one of the first scholars to describe the Florentine ethnic corsetry district formed of Chinese entrepreneurs and Chinese workers. In 1991, this production system consisted of at least 186 enterprises and 2500 employees. The district is a fragment of Chinese worldwide emigration which has involved 26 million persons, at least half a million of whom have settled in Europe.

The Chinese workers in Tuscany originate from the Zhejiang region, which comprises numerous free economic development zones, such as the

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<sup>3</sup> In this case, too, there is a possible substitutability between international trade and labour migration. Whilst, in the past, Asian engineers coming from India moved to the high-tech districts of the United States, today, many service and production activities in the software industry are subcontracted from developed countries to developing countries, and transferred via internet through international trade (Vang and Chaminade, 2009).



city of Wenzhou. The leather goods manufacturers in that city had acquired a dominant position since the Chinese economy joined the mercantile system. The district in Florence is not an enclave economy, because the Chinese firms are integrated with Italian supply and distribution firms. Half of the numerous interviewed entrepreneurs stated that they had learned their trade in Italy. Chinese immigration to Prato and Florence consists in migrant workers who are both skilled employees and entrepreneurs for whom a small business has provided opportunities for social mobility.

The Arzignano district comprises firms 'resistant' to the internationalisation and the relocation of the most labour-intensive phases abroad. The district enterprises did not undertake relocation processes; they rather absorbed immigrants coming from countries with low labour costs. In what follows, we will describe this new pattern in the organisation of production as 'reverse relocation'.

### 3. The case of the leather-tanning Arzignano district

#### 3.1. Birth and consolidation of the district

The Italian leather industry consists in 2003 of around 2,000 firms and 30,000 employees. It accounts for 65% of European production, and around 16% of worldwide production (Banca Intesa, 2006). According to the Banca Intesa report, Italy occupies a good position on foreign markets with an approximately 20% share, and it is the largest exporter in the world, ahead of China and Brazil (Banca Intesa, 2006, p. 7).

The three most important Italian districts are: Arzignano, specialised in the production of tanned hides for the furniture industry, which accounts for more than half of the Italian turnover; Santa Croce sull'Arno, in the province of Pisa, that mainly produces leather for shoe vamps and soles, accounting for 24% of national production; and Solofra in the province of Avellino, which mainly produces lighter leather for clothing, and which according to UNIC estimates covers only 6% of national output. The area delimited by Arzignano<sup>4</sup>, Valle del Chiampo and Montebello, in the province of Vicenza, represents about 130 km<sup>2</sup>. It is today the world's most

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<sup>4</sup> The municipalities making up the Arzignano district are: Altissimo, Arzignano, Brendola, Chiampo, Crespadoro, Gambellara, Montebello Vicentino, Montecchio Maggiore, Montorso Vicentino, Nogarole Vicentino, San Pietro Mussolino, and Zermeghedo.

exclusive enclave of leather-goods manufacturers in terms of both productive capacity and product quality. The Arzignano district represent about 40% of total employment in the national leather-tanning industry, which in 2004 were estimated at 28,586 units (source: UNIC).

As observed above, the district's main market is the furniture industry. Arzignano mainly produces hide for divans, a segment which, in 2004, covered approximately 48% of the production of firms in the area (Poster, 2005), while footwear accounted for approximately 25% of production, the automotive sector (leather seats) for 12%; leather goods for 8%, and clothing for only 7%.

The first historical evidence of the presence of the leather-tanning industry at Vicenza dates back to 1366 (Zampiva, 1997). The existence of a watercourse in which to perform raw hide laundering, and the extraction of tannin from the nearby forests, constituted the necessary but not sufficient conditions for the sector's development. It was under the Republic of Venice that trade by the leather-tanning industry began, especially between Venice and Milan. In that period, intense marine traffic with the Middle East led to the diffusion of the most advanced tannery techniques at the time in the area.

This benefited the industry not only around the Venice lagoon but also in its hinterland, and particularly in the Valle del Chiampo near Vicenza, which could rely on large amounts of clean water and trees from which to extract tannin, an essential element in the tanning process (Patto per lo Sviluppo del Distretto Vicentino della Concia, 2004).

The first catalogue of leather-tanning enterprises was published in Vicenza in 1855. It listed twenty enterprises, mostly located in the area of Bassano del Grappa. In the centuries that followed Valle del Chiampo became industrialised, first in wool manufactures (Signori, 1980) and then, when the latter slumped, in silk products. The silk industry declined owing to diminished demand during the two world wars and the strong Japanese competition (Patto per lo Sviluppo del Distretto Vicentino della Concia, 2004). This decline intensified during the 1950s. The last spinning mill closed down in 1968, when the boom in the leather industry had already begun. The tanning industry appears to have stagnated until 1951. Local sources identify the existence of only seven tanneries in Arzignano in 1927, employing 94 people. The census data shown in Tab. 1 illustrate the district's structural development.

### **Tab. 1 Evolution of the district**

Year	Tannery industry		Other connected manufacturing industries	
	Local units	Employees	Local units	Employees
1951	19	361	63	2,068
1961	100	1,929	91	2,765
1971	161	3,209	191	3,228
1981	602	6,358	230	2,606
1991	615	8,017	227	2,590
2001	649	7,988	222	2,514
2002	658	8,105	218	2,567

**Source: Our calculations on ISTAT data (1951-1981) and CCIAA of Vicenza data (1991-2002)**

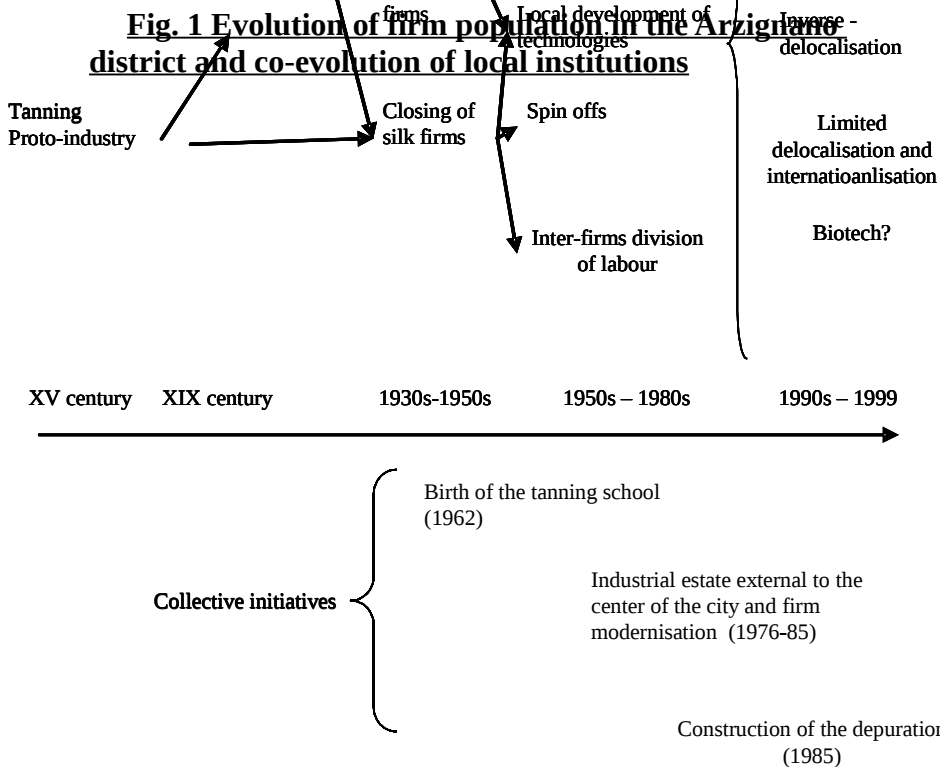
The 1951 census recorded 19 local production units and 361 employees. After its initial embryonic development, the district took off: in 1961 it had 100 local units and 1,929 employees, and in 1971, 161 local units and 3,209 employees. In the following ten years, the number of employees doubled, rising to 6,358, and the number of the local units quadrupled, reaching the figure of 602. The leather-tanning district embedded in the territory, becoming the dominant branch of the local economy. In 1991, 8,000 out of a population of approximately 90,000 inhabitants were employed in the tanning industry. At the same time, the bankruptcy of an important mechanical engineering company, Pellizzari, in Vicenza, activated a diffused process of new firm start-up in electro mechanics sectors. They were founded by the skilled employees laid off during the crisis of the firm. Thereafter, a flourishing tanning-machinery industry also developed in the area. The development of mechanical tanning technologies indubitably helped the district to introduce novel process technologies and boosted the district's growth.

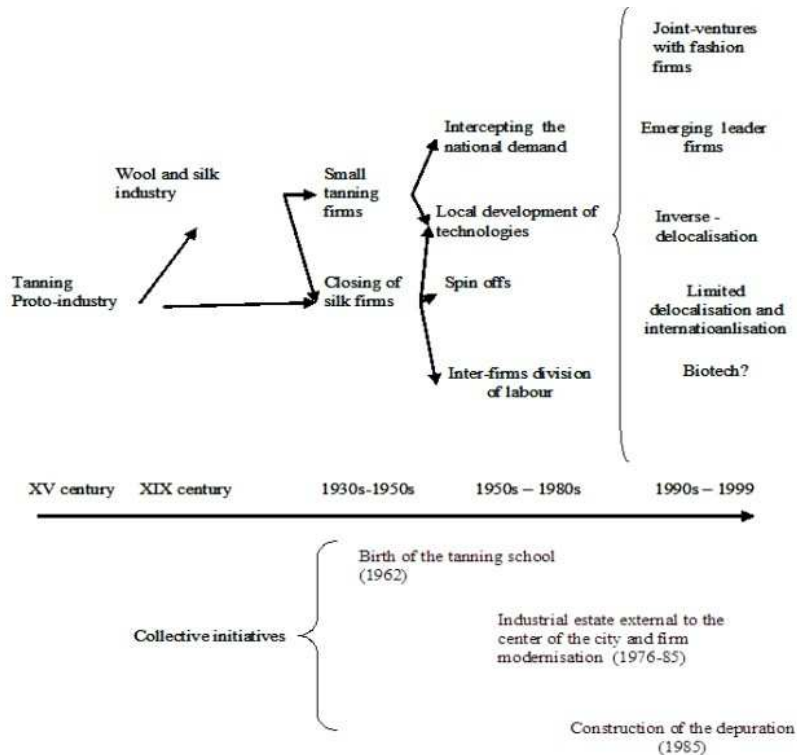
The first leather tanning machinery arrived in Arzignano in the 1950s, and was made in Germany, where a consolidated specialised industry had long existed. Later, the first manufacturers of machinery and tumblers for the tanning industry began to appear in the area. Currently, the Vicenza firms are global technological leaders (Banca Intesa, 2006, p. 17). The most important firms in the area are: Alpe, Industria meccanica 3P, Patisco Technologie, the firms formerly belonging to the Paletto Group, Officine di Cartigliano, TB Macchine per Conceria, and Incoma. In 2001 (ISTAT data), tanning-machinery production in the province of Vicenza concerned 44 local production units and 507 employees.

Initially, the district's birth was not founded on small firms, but on the expansion of a few large Fordist firms. Spin-offs from existing firms and new technical or blue collar worker entrepreneurship supported the formation of the today's district model. The growth of international demand stimulated the start-up of new initiatives, also ones of a commercial nature, and permitted the entry of new producers. The largest firms, instead of satisfying the increased demand by expanding their internal plant, activated the subcontracting system typical of Italian industrial districts, which enables firms to be flexible, allowing a broader specialisation and division of labour.

The subcontracting system appears to have been a key resource for the district's growth, and it has been crucial for the spread of entrepreneurship in the area. Fig. 1 illustrates the main stages of the district's development and the birth of collective initiatives (training, urban planning, and environmental improvement) supporting the co-development of firms and local institutions in the area. The district's consolidation has been due to the activity of support institutions in the provision of training and infrastructures, as well as to numerical growth in the population of firms.

In 1965 a leather-tanning chemistry school – *Istituto Tecnico Industriale per la Chimica Conciaria 'Galileo Galilei'* – was established, so that the district no longer had to hire specialised personnel from abroad and from Germany. At the same time, an industrial analysis laboratory was established.





**Source: Our elaborations**

Between 1976 and 1985 the municipality of Arzignano created a large three-lot industrial park with an expenditure of 6 million euros, inducing firms to transfer to the industrial park and modernise their equipment. The most inefficient firms were expelled from the market, and the largest firms took over the failed firms, thereby activating a concentration process. In those years, the Arzignano district ‘industrialised’ by eschewing the model of industrial district based on craft activity and short-series production, which still characterises the district of Santa Croce sull’Arno (Gjerdåkers, 2006). In order to promote clean technologies, the government supported the installation of a downstream purification plant, which was inaugurated in 1985 at a cost of 50 million euro. 65% of this sum was paid by the local government and the Veneto Region, and 35% by businesses. This plant serves 300 firms. In the early 1980s, a second purifier was built at Montebello to serve a further 40 firms.

Recently, in order to satisfy the demand for specialised personnel, Agenfor and the University of Padova have introduced a master’s course in ‘Tecnica di Processo e della Qualità dell’Industria Conciaria’ (Process and

Quality Techniques in the Leather Tanning Industry, IFTS). Moreover, CO.VI.AM (*Conceria Vicentine per l'Ambiente*), a consortium run by the Industrial Association of Vicenza, has been created to study new purification methods.

The Arzignano district therefore developed from proto-industrial activities until it assumed the form of a district with a high density of small and medium-sized firms and strong specialisation. In the most recent phase of its development the district has 1) absorbed a large inflow of immigrants, showing a 'reverse relocation' pattern, 2) internationalised the upstream activities of the value chain, in order to acquire the precious raw material.

The emergence of environmental problems have led to the stipulation of a territorial pact (*Patto per lo Sviluppo del Distretto Vicentino della Concia*, 2004). Various projects have been launched to develop new biotechnical technologies for raw hide treatment using enzymes (Galante, 2005). Compared with other districts, Arzignano also benefits from its capacity to exploit the potential of ICT: it has a web portal with e-procurement and e-commerce systems, as well as an extranet system, developed horizontally and vertically, connected to an integrated database (Rur – Censis, 2002).

### 3.2 Evolutionary patterns of the district: firm heterogeneity and hierarchisation

The literature on industrial districts has mainly focused on the Marshallian canonical district model as widely discussed by Becattini and colleagues. However, a large body of empirical evidence shows that some industrial districts have transformed into evolved districts, characterised by a marked heterogeneity of firms and the presence of leader enterprises. Numerous empirical studies show that Arzignano has maintained a high production capacity over time, albeit with a slight decline in exports, sales, and number of employees (Tab. 2).

The district is populated by a wide variety of company types. There are about 250 final firms and no more than 100 complete-cycle firms. Some are specialised in the various laundering phases (raw hide treatment to obtain wet-blue, semi-processed and semi-finished skins treated with chromium but not dyed or refined)<sup>5</sup>, others are focused on the refining stages. There

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<sup>5</sup> Currently these processes are carried out in the underdeveloped countries producing the raw materials. Some firms in the district have begun to produce these semi-processed materials in Brazil and China (Rino Mastrotto Group, Gruppo Mastrotto, Beschin and Dal Maso), some of which are then exported to Arzignano.

are more than 300 sub-contracting firms, of which 100 carry out mechanical and/or auxiliary processes and about 50 are commercial firms or work independently without any manufacturing activity (Poster, 2005).

**Tab. 2 Performance indicators of the district of Arzignano (000 euro)**

	Firms	Employees	Sales	Import	Export
2001	760	11,900	4,500,000		1,685,000
2002	736	12,154	4,479,000		1,670,000
2003	720	11,644	4,223,000	757,959	1,461,337
2004	721	11,504	4,257,000	714,713	1,391,400

**Source: Our elaboration on the Entrepreneurial local Association**

The leather-tanning district of Arzignano developed in a traditional manner through the expansion of small firms. However, recent data (Tab. 3) show that about 30% of employment is now concentrated in firms with more than 100 employees. It emerged from the interviews conducted, confirming the Censis (1995) findings, that there are 9 large groups in the area which control about 45 complete-cycle firms (from raw hide to the finished product) and which account, directly or indirectly through sub-contracted work, for about 30% of the district's turnover.

**Tab. 3 District of Arzignano: percentage distributions of firms and employment (2004)**

District	Size class				Total
	1-20	21-50	51-100	>100	
Firms	71.9	17.5	8.2	2.4	100.0
Employees	29.9	21.2	21.9	27.0	100.0

**Source: Poster survey (2005) on an estimated universe of 482 firms and 12,526 employees**

The main groups by sales volume are (Tab. 4) Rino Mastrotto Group, Conceria Cristina founded by Graziano Peretti, Mastrotto Italia, Conceria Sabrina founded by Callisto Dal Maso, Duma, and Mastrotto (Partnership Equal G-local, 2004).

**Tab. 4 The main tannery firms of arzignano (2000)**

	<i>Sales (euro)</i>	<i>%</i>
Gruppo Mastrotto *	266,000,000	40.5
Rino Mastrotto Group	182,000,000	27.8
Conceria Cristina	105,000,000	16.0
Conceria Sabrina	102,000,000	15.7
Totale	655,000,000	100.0

**Source: Partnership Equal G-local (2004) and Furlan and Plechero (2007). \* from 2003 it includes Duma and Conceria Mastrotto**

### 3.3 Embeddedness and “reverse relocation”

The interviews conducted with entrepreneurs and workers in the district highlighted three main factors influencing the strategy of embeddedness adopted by the Arzignano firms, and which have slowed relocation processes: 1. the phenomenon of embeddedness of expertise; 2. the Marshallian external economies, and 3. the social embeddedness of entrepreneurs.

The term ‘embeddedness’ refers to the existence of tacit knowledge rooted in the district and in the professional skills of workers employed in the local firms. The difficulty of codifying these skills makes any greenfield investment operation abroad risky. The necessary presence of these skills is readily apparent in Fig. 2, where different colours indicate the various professional figures employed in the production phases. Reproduction of these skills is complex because they are based on the experience of senior workers and are normally transmitted within the firm to new workers via of learning on-the-job.

The processing of hides requires great experience and artistic sensitivity. Transforming hides from the raw to the finished state involves about eighty different operations, each of which requires specific machinery and actions by ‘intermediate’ qualified personnel, such as chief machine operators, pickers, and product controllers, or professionals (such as dyeing and refining technicians) who possess key skills in the use of the chemicals to be added to the process (Coquinas, 2001). Also required are purely manual workers (generic workers) able to perform routine operations (see Tab. 5).

The model of ‘reverse relocation’ is confirmed by the large presence of foreign workers (Tab. 6). The main migratory flows are those involving workers from Asia and Africa. At Arzignano, non-EU immigrant workers are mainly employed in tanning activities (Anastasia and Bravado, 2004, p. 205). Official sources estimate their total number at 6,322 (Poster, 2005).

**Tab. 5 Employees by job classification in the tannery firms of Arzignano (2004)**

Job	AV	%
Unskilled workers	6,895	57.3
Skilled workers	2,613	21.7
Office workers	1,398	11.6



Technicians	678	5.6
Managers	442	3.7
Total	12,026	100.0

**Source: Poster (2005)**

**Tab. 6 Immigrant employees in the Arzignano district (2004)**

Country	A. V.	%
Asia	2,065	44.5
Central Africa	1,294	27.9
East Europe	906	19.5
North Africa	322	6.9
South America	57	1.2
Total	4,644	100.0

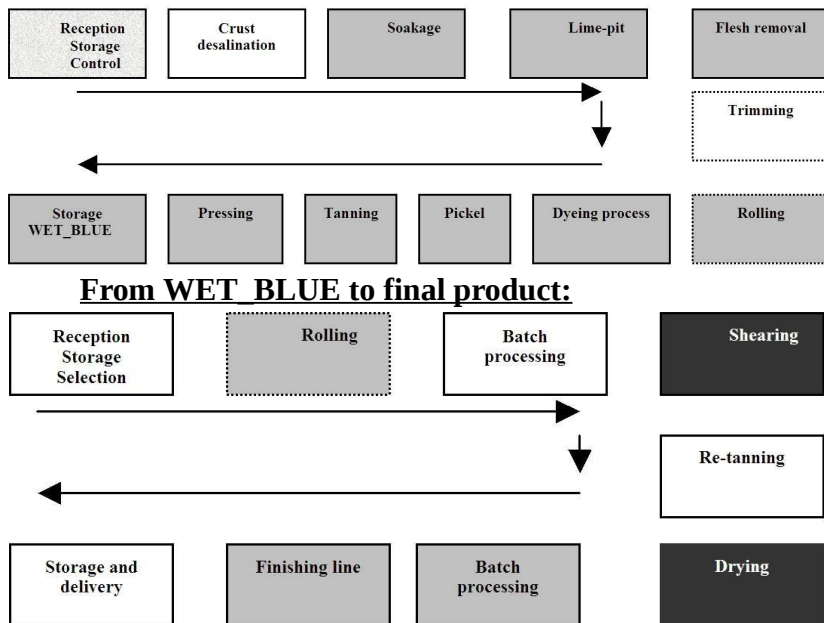
**Source: Poster (2005)**

Specific processing operations constitute 75% of the activities carried out in the tanning value chain (Fig. 2). These are usually performed by workers aged over fifty who are not inclined to move (Molina, 2003). In particular, re-tanning and dyeing – wet operations which take place in the tumblers – are based on more or less secret ‘company recipes’, and on which the final result of the tanned skin depends.

Any errors made in the subsequent stages are difficult to remedy. Mismanagement of the process would be extremely costly because raw materials account for 60% of the total cost. Ennoblement of the product takes place in the finishing phase, which involves the application of resin, pigments, colorants, oils, wax and plastic film, using spray and roller techniques. Mechanical stages like polishing, printing, ironing, burnishing, dry tumbling, and brushing are in some cases outsourced to local sub-contractors but also require constant supervision. Drying operations (considered routine) are nearly always outsourced to sub-contractors in the area.

Around 40% of the skins arrive in the district in their raw ‘crust’ state (cured with salt and greased) and are then dyed and finished; 60% of skins are purchased already at the wet-blue stage.

**Fig. 2: The tanning process value chain**  
**From raw material to WET BLUE:**



**Source: Our elaborations**

This brief description shows that the phases of the value chain are strictly sequential, implying that relocation abroad of the final labour-intensive phases would be difficult. The few large local firms to have relocated often do not re-import products into Italy for final checks, but sell them directly abroad. In some cases, these firms import wet-blue leather to ensure the better quality of finished products. High quality production is again entirely carried out at Arzignano. The Mastrotto group, which derives from Conceria Mastrotto founded in 1958, has been present in Brazil since 1998, where it has built a new tannery with Bertin di Lins: Bermas<sup>6</sup>, which specialises in the low end of the market. In 2001 the Gruppo Mastrotto launched a joint venture in Brazil – at Cachoeira in the state of Bahia – with Mastrotto Reichert Sa (Furlan and Plechero, 2007). In 2000 the group acquired a tannery specialised in processing raw hide up to the wet-blue stage, situated in Croatia near Zagreb. In 2005 Mastrotto opened a tannery in Indonesia: Mastrotto Indonesia Pt (Furlan and Plechero, 2007). In 1994 the Beschin

<sup>6</sup> The Bertin group in Brazil is a large producer of bovine meat (it currently butchers 4500 heads of cattle a day). In 2004 its estimated turnover was \$122.000 for about 10 million m<sup>2</sup> of hides. The company employed 1841 people. The Italian group head in 2004 declared 238 million euros of turnover, a similar production of 10 million m<sup>2</sup>, produced, however, by 512 employees. The average annual cost of an employee in Brazil is 3,500 euros compared to the 25,000 euros paid by the company in Arzignano (company source).

tannery started up a joint venture factory in China to serve the Asian market. In recent years, the Rino Mastrotto Group has shifted from investment in the Chinese distribution network to the operation of a tannery. Recently created has been Dal Maso Group Hong Kong Limited, which markets leather goods and controls Dal Maso Leather Co. Ltd, which has opened a factory in the Chinese province of Guangdong.

The second factor explaining the dynamics of internationalisation of the tannery district concerns the competitiveness due to the 'district effect', namely the presence of external economies which are not immediately transferable to underdeveloped countries. The division of labour established in the 1980s and 1990s yielded considerable economies of scale in the various production phases. If these economies are to be maintained over time, complete relocation is necessary not only of the final firms but also of their sub-contractors, a process which is obviously difficult to accomplish.

Innovation in the mechanisation of tanning processes by the small local machine producers has always provided Arzignano firms with a formidable competitive advantage which has off-set their higher labour costs. For example, a comparative study conducted in Spain on the production cost structures of tanning firms in Igualada, Arzignano and Sind in Pakistan (Conejos et al., 1997) showed that, given similar market prices for raw materials, the Arzignano firms pay a unit labour cost (28 euros per m<sup>2</sup> of calfskin treated with chromium – box calf) similar to the firms in Pakistan (27 euros), and much lower than that of the Spanish firms (48), and that they further benefit from lower general costs (19 euros versus 29 in Spain). In relation to this cost structure, relocation intended to use low-paid labour does not seem a necessary choice. In the end, what ties a firm to the territory is not only the pool of skilled labour available in the district and the presence of specialised sub-contractors, but also the existence of a collective water purifier. Evidence is that a firm willing to disconnect from this utility must pay the high costs of acquiring a new purification plant. This constraint, besides anti-pollution legislation in the host country, can only be overcome if the relocation involves the transfer of a large number of firms able to share the costs of a new purification plant.

The third factor is the scarce propensity of local entrepreneurs to transfer abroad. When small firms internationalise, they greatly suffer from the *liability of foreignness*. Small family-run enterprises are not in a position to amortize the costs of a new investment in the short term, given the numerous risks that they may encounter without knowledge of either the language or the local culture. Data issued by the Poster Institute (2005)

confirm the marginality of current relocation processes by the entrepreneurs of Arzignano. Out of an estimated 368 million euros of decentralised processes, only 0.8% concern foreign firms, and only 3.8% firms located outside the district within Italy.

This tendency seems somewhat at odds with the district's marked openness in terms of the destinations of its exports, for which the main customers are firms in Hong Kong, China, Romania, and Spain. The large international clothing, leather, and footwear brands produce in the East, but they acquire their raw materials from Vicenza. The production pole for buyers is now Guandong, which produces 20% of leather furniture in the world and 30% of the footwear related to the lower segment of the market. The district of Arzignano, however, seems able to maintain its leadership in the medium-to-high segment.

## 4. Conclusions

The Italian industrial districts have for many years engaged in the globalisation of sub-contracting chains and the network of sales agents and channels, thus boosting their international competitiveness. In the leather-tanning district of Arzignano, the 'classic' model of internationalisation through FDIs (Tattara *et al.*, 2006), which has been pursued by only four large firms in the district (Rino Mastrotto, Gruppo Mastrotto, Dal Maso and Beschini), is flanked by a new model based on the attraction of human resources from foreign countries.

This is not a new model for Italian and foreign industrial districts: it is also present, for example, at Prato (Becattini, 2003), where new Chinese firms have repopulated the district. This model has characterised the development of the high-tech American districts, a case in point being Silicon Valley (Saxenian, 1994; 2000). In the Arzignano district, the most significant change concerns the inflow of unskilled labour absorbed by local firms, which involves almost one-third of the workforce hired in the district. The positive aspects of 'reverse relocation', which is adopted as a second best solution, concern the district's growth model, which appears able to redistribute more income to local factors. The analysis conducted has shown that the district's territorial embeddedness is mainly due to the skills possessed by senior workers which are of crucial importance in almost all phases of the value chain. The transfer of their skills to new workers is a slow process based on long-term company apprenticeships. As stated in the district's territorial pact (*Patto per lo Sviluppo del Distretto Vicentino della*

*Concia*, 2004, p. 12), firms in the district “have not activated a mechanism for codification or transmission of practical knowledge”. Notwithstanding many innovations “... the processing of hides continues to be a scarcely pre-definable process and requires complex decisions at an operational level” (p. 12). The complexity of plant and the sequentiality of operations are the main risk factors which dissuade local firms from undertaking the relocation route. The personal reasons making small-medium entrepreneurs unwilling to transfer abroad or to outsource their activities to local sub-contractors must also be considered.

The district has progressively become a global leader by developing specific expertise in the treatment of hides and their finishing. Even in districts that have delocalised, such as the sport-system district of Montebelluna, high quality production is still undertaken locally (Sammarrà and Belussi, 2006). In contrast to Arzignano, at Montebelluna relocation has been activated collectively, with sub-contractors adopting follow-the-client strategies. At Arzignano, intermediate components are produced to be sold to firms in furnishing, footwear, and car industries which are mainly located in Europe.

Compared with the growth strategies of the other leather-tanning districts, which have transformed into “Marshallian nodes in global networks” by concentrating their activities on a few manufacturing niches (see the case of Santa Croce, Florence), Arzignano has followed a distinctive path by resisting the strong competition that arose in the 1990s and relying on embeddedness and high industrialisation of the production cycle.

The adoption of a ‘reverse relocation’ strategy acts as a strong barrier against the leakage of strategic skills to the industrialising countries. This is an interesting – and involuntary – collective process of protecting innovation as an alternative to the standard form of patenting.

Our study raises several important issues concerning the international development trajectories of Italian industrial districts. The heterogeneity of firms and their sectors of specialisation prevent the predominance of a single optimal route but generates numerous evolutionary paths. The foregoing analysis highlights a particular internationalisation strategy adopted by firms closely constrained by the nature of their produced goods and the local availability of natural and human resources. A process of learning and the intergenerational change of entrepreneurs may make the adoption of the first best solution possible in the future.

The Arzignano district's 'industrial atmosphere' consisting in the best designers of tannery machinery, the advanced professionalism of firms specialised in chemical products, a permanent school – the *Istituto Conciario Galileo Galilei* – and an efficient tannery waste purification system forms an integrated system which would be difficult to replicate, and whose relocation at present does not seem to be viable. Flexible laws to facilitate the entry and integration of immigrants intending to work in this sector could favour incoming mobility from other countries, replacing manual workers and functioning as a substitute for forms of delocalisation induced by cost constraints (cost-driven outsourcing). It is to be hoped that closer attention will be paid to the skills needed for highly capital-intensive activities aimed at expanding the pool of professionals required by local entrepreneurs. As already happens in many high-tech districts, there is now a growing labour demand for highly-qualified engineers and technicians able to support the organisation of long production chains (direct foreign investments or sub-contracting).

The case of Arzignano also prompts a number of considerations concerning the acquisition of advanced knowledge in the field of biotechnologies in order to improve the eco-compatibility of the production process through knowledge offshoring to district institutions, and public and private research laboratories working on these issues.

The model of 'reverse relocation' seems to be a major factor in local development which prevents the activation of de-industrialisation mechanisms and induces local actors to invest in higher value-added production phases.

A final consideration concerns the integration of immigrants into the district's social context. Attracting and keeping a foreign labour force also means endowing the local community with the social, educational and religious institutions which guarantee immigrants an adequate lifestyle.

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