

## The Ceramic Tile District, its Evolution and Possible Future Alternatives – a Comparison of Italy and Spain

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### 1 Theoretical framework

#### 1.1 The concept of industrial district

The concept of industrial district has traditionally been defined as a socioeconomic entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area [3]. An industrial district supposes the existence of a population of firms that are special-

### Abstract

Territorial agglomerations have been paradigmatic examples of localised knowledge and endogenous development that are capable of containing the whole value chain of the respective production processes [1, 2]. Nevertheless, it is a widely acknowledged fact that they are currently going through a period of uncertainty and at the same time are undergoing important changes. In order to further our understanding of what may happen in the near future and bearing in mind the context in which industrial districts currently find themselves, we conducted an analysis and com-

### Tile & Brick International Manual 2009

parison of two industrial districts in Spain and Italy with the aim of establishing exactly how they have evolved in recent years and the kinds of relations they have developed. Our aim is to prove that the development of one cannot be explained without taking the other into account. Therefore, any attempt to understand the future of the districts should be based on this consideration.

**Keywords:** ceramic tile district, Castellón, Sassuolo, comparison, internationalization, strategy

ised in one or more phases of the production process. The district is characterised by holding a group of firms that work together, where the division of labour takes place on an interfirm rather than intrafirm basis. Although, taken as a whole, the relations that are developed owing to geographical proximity may vary considerably in their details, their underlying logic remains constant. Thus for instance, despite having their own specific characteristics, the organisational principles upholding the districts in south-west Germany and north-east Italy are widely applicable. Similar interfirm cooperation is often found in economic activities carried out on a regional/supranational scale (e.g. Scandinavia) or in local contexts, such as Silicon Valley in the United States. A case study therefore shows the universal nature of the phenomenon.

The first elements justifying the benefits that industrial districts offer firms are Marshallian, or agglomeration, economies. The author of the original concept of Industrial District, [4], identified a type of external economies that focus on the benefits to be obtained by individual firms from the increased pooling of common factors, including skilled human resources, specialised suppliers and technological spillovers [5]. Likewise, the Marshallian concept of industrial atmosphere can be interpreted as referring to the existence of intangible resources based on experience, knowledge and information that are

common to district firms. Several researchers have claimed that territorial agglomerations benefit firms in the form of intangible externalities or untraded interdependence.

Others underline the superiority of this form of industrial organisation over mass production and vertical integration firms [6]. Yet, as pointed out by some authors [7–8], the most important advantage of industrial districts lies not so much in agglomeration economies but rather in the existence of a community of people. Mutual knowledge, ongoing business relations and experience foster relational trust [7–8] and this relational trust limits the chances of opportunism among partners in the communitarian market within the industrial district [9]. In fact, relational trust is fundamental in explaining the most important net result, namely, the paradoxical combination of cooperation and competition inside the industrial district [7].

Within the context of our work we understand the notion of district in a broad sense of the term, as referring to a physical and relational space where externalities are generated for firms. Despite the different visions that can be found, a review of the literature provides us with a set of common ideas and postures that are useful for our research and which we have set out in the following points:

- Face-to-face contact and physical proximity between firms facilitate interaction and the

transfer of resources and knowledge, which would be difficult to achieve with long-distance relations.

- The critical value of districts has more to do with social or relational resources than with tangible externalities or physical infrastructures.
- Of those who participate in districts, the leading players are not only final firms but also suppliers of the different products and intermediate services, as well as a wide range of institutions, such as universities, trade associations, industrial policy agents and other local or regional institutions.

## 1.2 The recent evolution of districts and the dynamics of the new competitive scenario

The evolution of the European districts can be summed up as follows. They came into being in the sixties, consolidated themselves and grew over the ensuing decades and finally, and more especially in the last decade, the situation has become somewhat unequal but nevertheless critical for districts as a whole.

Since the sixties, highly-specialised SMEs that are strongly interrelated and situated within clearly delimited territories have managed to adopt the leading positions in a number of industries. The main feature defining districts has been the fact that they belong to a particular territory. Internationalisation meant that the final products from the district gained access to international markets, but the value chain as a whole remained anchored in the home territory. This loyalty to the territory, however, was not seen to be a limitation but rather a deliberate strategy, since the competitive advantage of these firms lay precisely in the existence of such allegiance.

Now, however, because of a series of factors deriving from the phenomenon of globalisation, such as the emergence of China and other low-cost countries, European districts are under a huge amount of pressure to remain competitive. In some districts growth has fallen drastically and in some cases has even reached negative rates. Many firms have disappeared, while others have moved to external settings. The new emerging countries (low-cost producers) are densely populated, rapidly-growing nations that produce a wide variety of industrial products with up-to-date, universally available technology.

In fact the challenges of globalisation involve not only relocating production as a way of taking advantage of lower labour costs, but also a variety of international outsourcing methods, with or without investments by the firms. Technological innovation in production and distribution is a part of business strategy due to its having an enormous influence both on production costs and on the speed with which firms can respond to changing demands. All firms acknowledge the crucial importance of participating in global innovation networks, which require the development of relations with suppliers, distributors, financial systems and customers.

In conclusion, European industrial districts have had to urgently rethink and redesign their strategies. The responses to these challenges, however, may require certain changes in the way firms go about their business. Firms are becoming more and more dependent on the environment surrounding them, including universities, research institutes and other institutions related to the generation of new knowledge. Furthermore, sources of knowledge may be located a long way from the local setting. In addition, new opportunities probably mean greater specialisation and firms therefore need to expand their markets beyond the limits of their own local territory in order to upscale. In general, the firms within districts need to resize their markets, cooperate, build partnerships and enter into collaborative ventures with other districts and countries.

## 1.3 The bases of the new international competitiveness

The transformation of the district can be seen as being a change from a district based on vertical coordination and territorial adhesion to one that rests on horizontal coordination and multi-location.

In the first vertical coordination and territorial adhesion model, as the name suggests, the activities carried out by the district are coordinated vertically. There is an internal division of labour, where firms position themselves on different stages of the local chain. Most of the inputs and services that support the main activity of the chain come from within the district itself. Local and regional institutions also support the whole process, and their scope of action is also local. Only firms that make final products have access to external markets. Further, the development of advanced business and marketing serv-

ices and, in general, of business activities that are closest to the final market is relatively scarce.

The new model of horizontal coordination and multi-location district, however, undergoes a twofold transformation. On the one hand, certain phases of the productive filiere are relocated through outsourcing agreements or by direct investment in productive activities in other areas. In this case we are talking about productive activities with a low added value that are invited to leave the territory and move to new production sites. These activities follow the process of ubiquitification [10], where a territory loses its competitive advantage to others with lower costs. A second relocation process affects the product distribution channels. Distribution channels are controlled by setting up business subsidiaries or creating joint ventures in the markets in export countries. Firms need to make additional efforts to control the channels in destination countries, in markets that are increasingly dominated by aspects related to marketing [11].

A third element is the development of strategic relations with suppliers outside the district in activities such as technological innovation, product and design projects, marketing and financial services.

The activities that remain inside the district continue to enjoy the advantages of the traditional district model based on internal development within a local context of a market for intermediate goods, services and resources. It may be added that the existence of a network of local institutions favours the operation of the whole internal system [12]. Internal activities undergo a process of outsourcing in an attempt to take advantage of new business opportunities. Generally speaking, productive activities lose a certain amount of influence in comparison to those involving services and business. Moreover, activities become more specialised, a process that means collaborating and setting up partnerships with other outside firms. This model, however, needs to resize its markets so that territories that were formerly competitors become natural extensions for the new products and services that local firms have generated. To achieve this, an inter-territorial, horizontal coordination of activities is required. The main activities that previously defined districts may be replaced or pushed to one side by new activities that adapt better to the new circumstances. In other words, firms lose their adherence to their home territory.

## 2 Comparison between Castellón and Sassuolo

### 2.1 General aspects

Since the seventies, Italy has benefited from a well-known academic tradition relating to the industrial district that began with the seminal work by Becattini [13]. Although not as widely known as the Italian research, a considerable number of studies have also been published on Spanish districts, and more especially concerning the Valencia Region [14]. The literature covers in particular the ceramic tile industry [15–17].

In general terms, it is not easy to find works that compare the two situations or reflect on their possible interactions or mutual influences; researchers seem to be more inclined to analyse the experience of their own country and are reluctant to investigate similar districts or countries that can interact or develop together. Moreover, a supranational unit of analysis is required.

On comparing the data from the two countries, the most striking fact is how similar their structures and macroeconomic results are. Although the economy of Spain lagged behind that of Italy for some time, it is also true that the former has quickly reduced the gap in the last twenty years. Indeed the Spanish per capita GDP has now reached a figure that is very similar to that of Italy. This also means that the costs of factors (for example, labour) have similar values. Spain, therefore, can no longer be considered to be a low-cost country in relation to Italy and so firms in both countries face the same challenges of looking for high market segments.

SMEs predominate in the structure of both countries, and more especially in their industrial districts. According to the Observatory of European SMEs, microenterprises accounted for 95.6 % of enterprises in Italy and 93.3 % in Spain. In contrast, large firms account for only 0.07 % and 0.10 %, respectively. As far as employment in each category of firm is concerned, over half the employees belong to microenterprises and less than 20 % work for large enterprises (16.4 % in Italy and 18.3 % in Spain).

With regard to the existence of industrial districts, according to the Observatory of European SMEs (2003), there were 199 districts in Italy, in which more than 40 % of the industrial workforce was employed; the same source gave a figure of 142 districts for Spain. The Spanish Ministry of Industry (2005) has recently drawn up a map of local systems and districts both for Spain and for Italy. According to this study, Spain had

a total of 806 local systems and 237 industrial districts with 1,288,000 employees. The ratio between employment in districts and in industry as a whole was 14.8 %. In Italy, on the other hand, there were 784 local systems and 199 industrial districts, with 2,173,801 people employed, which accounted for 20.1 % of the total number of employees in industry.

Although these figures are not altogether free of certain contradictions and inaccuracies, we can use them in our study to state that the two countries are characterised by having similar macroeconomic results, both in terms of their GDP and costs. In both countries it can also be seen that there is a dominant presence of SMEs and industrial districts.

### 2.2 Situation and evolution

The ceramic industry includes the production of floor and wall tiles, decorative pieces, glazes and frits, machinery and equipment, and other activities related to the process of manufacturing ceramic tiles. It is an industry that is distributed around the world mostly in district-type geographical concentrations in countries such as China, Spain, Italy, Brazil, Portugal and so forth.

The Spanish district is situated in the province of Castellón and more specifically in the areas of la Plana Alta, la Plana Baixa and L'Alcalaten. Over 90 % of the Spanish output of ceramic floor tiles is manufactured in this district, which has a radius of only 20 km. Spain is the number one producer in Europe and ranks second only to China on the list of worldwide producers. In 2004, in terms of value of sales, Spain reached the 21.2 % global market share.

The Italian district is concentrated in the region of Emilia Romagna, above all in the provinces of Modena and Reggio Emilia. In 2002, the two provinces accounted for 80 % of the total Italian output. If we include the whole of the Emilia Romagna, the figure rises to 90 %. This district is called Sassuolo, because this is the name of the municipality that is home to the highest percentage of ceramic tile companies. Italy is ranked second in Europe in terms of output. It is also the leader as regards market share worldwide, with 25.7 % of the global market in 2004.

On comparing the two districts, we find that Sassuolo led the way in the transition from craft manufacturing to industrial production, and this quickly allowed it to become the world's leading

producer. Nevertheless, in the late nineties, Castellón was able to close the gap and even overtake Italy on certain indicators. For instance, on comparing output data, whereas Spain only reached half the Italian output in 1990 (225 million m<sup>2</sup> versus 447 million in Italy), at the beginning of the current decade Spain had overtaken Italy in terms of m<sup>2</sup> produced.

In Spain, according to ASCER, in 2004 output reached 640 million m<sup>2</sup>, with a turnover of 3671 million €; 54 % of sales were exported and it provided employment for 25,000 people. In the Italian case, according to ASSOPIASTRELLE, in 2004 the sector employed about 30,000 workers, with an output of 589 million m<sup>2</sup> and a turnover of 6334 million €; 70 % of sales were exported. Spanish firms achieved better results in financial indicators, with a mean added value of 33.7 % for Italy versus 36.2 % for Spain, and a mean ROI of 3.2 % versus 5.1 % for Spain [18].

### 2.3 The structure of the districts: size of firms and their specialisation

In the case of Castellón the founders of some of the firms are still participating actively in their businesses. We might say that the first shift from one generation to the next has still not completely finished. In the Italian case, however, they are second or third generation entrepreneurs and there is a higher presence of professional executives. In the final product sector, the average size of firms in the Spanish case was 99 employees, while Italian firms employed an average of 132 workers.

Although in both cases the output of ceramic wall and floor tiles is the core activity, other important productive activities have also been developed. In Sassuolo, apart from products, services and complementary services, the most important business activity is the subsector dedicated to machinery and equipment. According to ACIMAC, in 2005 there were 175 firms in the Italian subsector with a turnover of 1777 € and an export rate of 74 %; in contrast, in Spain there is no important machinery subsector.

The Spanish subsector is made up of about 70 firms belonging to ASEBEC, with a turnover of 235 million € and 18 % of output is exported. An important percentage of these firms are Italian subsidiaries or joint ventures. To explain the Italian advantage, it must be noted that in the production of machinery the economies of scale are far more important than in other processes. And when firms order entire plants it becomes difficult

for new firms in other countries to compete (as is the Spanish case). It must also be remembered that the Italian zone (Emilia Romagna and especially Bologna) possesses a long, brilliant tradition in mechanical engineering and is therefore well-suited to housing his branch of industry.

In Spain, the subsector devoted to ceramic glazes and frits is the most relevant of the productive activities carried out in the district. Several reasons have been put forward to account for its success. First, there is the cost advantage (especially before the nineties) in labour, and fewer and less strict environmental controls. Second, there exists a well-integrated network of research institutions, such as the Institute of Ceramics Technology (ITC), the Universitat Jaume I and, above all, the efforts firms put into innovation and the internationalisation. In 2004, the Castellón district had 26 frit and glaze firms with 3669 employees and total sales of 889 million €; the percentage of exports was over 60 %. Mention should also be made of a recent and important process of relocation of activities, with the consolidation of large multinational groups that originated inside the district. In Italy this activity seems to be less important. For example, only twenty firms belong to the association CERAMICOLOR and what is even more significant is that some Spanish firms are also members (Esmal-glass, Torrecid, for example). According to the latest figures for 2004, the total turnover for the Italian subsector amounted to 518 million €, with a 29 % export rate.

Although Italy and Spain often compete in the same markets and segments, the two countries do each display a certain degree of specialisation. Traditionally, Spain has focused on wall tiles, while Italy has concentrated more on floor tiles. This fact has facilitated the development of specific technologies. In Spain, the porous single-firing technology was developed in order to get round the problems that arose from producing wall tiles, which were more demanding in terms of calibre and gloss. Although Spain began producing stoneware floor tiles on a large scale, Italy has become specialised in the production of porcelain tiles, or porcelanatto, which is more resistant and belongs to a higher segment. According to ASCER (2000), while Spain produced 55,300 m<sup>2</sup> (8.5 % of the total amount), Italy manufactured 308,000 m<sup>2</sup> (55 % of the total output). This difference in specialisation explains why Italy earns more from sales despite having a lower output.

## 2.4 The institutional network and how the district is governed

In Castellón, the district receives a great deal of support from the local and regional authorities. The trade associations ASCER (ceramic floor and wall tiles), ANFFECC (frits and glazes) and ASEBEC (machinery and equipment) are all very active within the sector. The Universitat Jaume I, vocational training colleges, the Institute for the Promotion of Ceramics, the Institute of Ceramics Technology and the S. Carpi Laboratory, among others, all carry out research and educational activities, as well as running specific training courses for human resources. Other important institutions are the CEVISAMA trade fair and the QUALICER international congress.

In the Italian district, support from the public authorities is somewhat more limited and less specific. There are a number of strong business associations and the human capital is more highly skilled in the areas of design and business management. The educational system focuses more on vocational training and not so much on university training. It is a setting in which firms are particularly skilful in design and commercial aspects. Trade associations include ASSOCI-APRIASTRELLE (ceramic floor and wall tiles), CERACOLOR (frits and glazes) and ACIMAC (machinery and equipment). Other relevant institutions are the Universities of Bologna and Modena, the CERFOM and the Bologna Ceramics Centre, which is run by a consortium from the university.

Governing the system as a whole can be understood as involving all the processes, habits, policies, laws and institutions that affect how a district is run, administered or controlled. It also encompasses the relations among the many agents involved in them. The district is a network without a head, where the different stakeholders have to strike a balance and agree on all issues that affect them as a whole. Thus, power is decentralised and a great variety of institutions and firms take part in the decision-making processes. Because different levels of government (local, regional, national and European) and public and private institutions (some of which are merely representative while others are more specific to certain domains) must be taken into account, governing a district becomes a complex matter. The firms involved are not equally important and their growth dynamics are also different.

## 2.5 Internationalisation

Both countries and China are leaders in the international markets. Yet, it can be seen that the international image of Tiles of Spain is not as widely recognised as the Italian brand name. In Italy, design, business, marketing and customer service competencies are better than in Spain. The collective identity of the Italian industrial district benefits from a strong country-brand.

In recent times, both countries have been suffering the consequences of the sudden arrival of China on the international scene. China has gone from a world market share of 2.1 % in the year 1999 to 19.8 % in 2004. Nevertheless, Spain seems to be resisting this new source of competition relatively better than Italy (at least this is what can be deduced from the recent development of their respective market shares). In 1999 Italy had 39.4 % of the market versus Spain's 25.6 % and yet, whereas Italy lost 14 points and dropped to 25.7 %, Spain managed to remain steady with 21.2 % in 2003.

In the case of Spain, exports rose to 54 % in 2004, with a value of 1860 million €. The destinations for Spanish exports were mainly Europe and the USA, which accounted for over 87.3 % of the total. Italian output was 3671 million m<sup>2</sup>, turnover was 5334 million € and 70 % of sales were exported.

The data available on Italian machinery and equipment manufacturers show an accumulated growth of over 70 % for the period 1988–2002 both in terms of total turnover and exports. This increase was far more notable in the early nineties, when it coincided with the sharp rise in output of ceramic products in Spain, followed by a recession and then a recovery in sales in the late nineties that dropped slightly towards the end of the aforementioned period.

With a turnover of around 1500 million €, the production of machinery for the ceramic industry has given rise to an export dynamics that is comparable to other segments of the machinery and equipment manufacturing industry in Italy [19]. According to ACIMAC statistics in 2005, exports reached 74 % of the total turnover, with a value of 1777 million €. In contrast, the figures for Castellón were a turnover of 235 million € and 18 % was exported. Another feature worth highlighting is the fact that a significant percentage of these firms are Italian subsidiaries or joint ventures.

According to the latest figures, on the other hand, the Spanish frit and glaze subsector has

experienced a growth in turnover from 198 million € with 52 million € in exports (26 %) in 1990 to 889 million €, with exports worth 535 million € (60 %) in the year 2004. This has been accompanied by a considerable process of expansion in foreign markets, not only in sales but also in the creation of subsidiary firms in countries where products are sold, including Italy. The Italian subsector exported 29 % of the total turnover, which reached 515 million € for 2004.

### 3 Conclusions

From this brief comparison between the two districts perhaps the most important conclusion that can be drawn (at least as far as our study is concerned) is that we have confirmed the existence of a high degree of interdependence between both districts. Each district acts as a customer and a platform allowing the internationalisation of the other. Moreover, each district supplies the other with final products and inputs from ancillary activities. This fact has led to a twofold outcome: on the one hand, it has conditioned the development of the productive activities within the districts and, on the other hand, it has meant that the two districts have diversified their production with respect to one another.

Furthermore, this interdependence is based on a network of formal, institutional and also informal relations. Other examples of more formalised relations would be the fact that firms from the two districts participate in the trade fairs held in both countries, or that firms from one district are also members of the business associations in the other. Both the high rate of exchange of information among technicians and executives from the two districts and, more especially, the presence of Italian technicians in Spain constitute formal mechanisms for the transmission of experiences and information.

(1) The mutual conditioning of the two districts can be illustrated with the following examples. The absence of a strong machinery and equipment subsector in the Spanish case, on the one hand, has been a consequence of the strength of its Italian counterpart and, on the other hand, has perhaps allowed the Castellón district to focus on other activities, such as the manufacture of frits and glazes. On the Italian side it is worth pointing out that the great expansion enjoyed by the machinery subsector in the early nineties coincided with a substantial growth in Spanish output of ceramic products and, conse-

quently, with the rise in the number of new plants this brought with it. Although it has been argued that this absence, in the Spanish case, was a weakness, there is no evidence to justify the claim that Spanish manufacturers were at a possible disadvantage because they did not have their own machinery subsector. In contrast, technological innovations have appeared indistinctly in each of the two countries. This is the case, for example, of the roller kiln or high tonnage hydraulic presses. The frit and glaze subsector, however, is the true driving force behind the Spanish district, especially in terms of its capacity to innovate. And this subsector has Italy as the main destination for its exports.

(2) Diversification of products between the two districts. Another interesting point concerns the existence of specific technologies in each district, for example, porous single-firing. This technology was only developed in the Spanish district and is undoubtedly the result of a specialisation in different products by the two districts. The technology arose as a way to satisfy a need (how to apply single-firing to wall tiles) that was far more urgent in Castellón because of the specialisation of its products. Castellón had specialised in wall tiles and large sizes, whereas in Italy the emphasis was on white body floor tiles and porcellanato.

(3) Inter-district trade. The data we have available on inter-district trade show that, as far as final products are concerned, Spain purchased floor and wall tiles worth 52 million € (60 % of imports) and sold 68 million € worth to Italy, which accounted for 17 % of all exports. We have also mentioned that Italy is the number one customer for the Spanish frit and glaze sub-sector. Spain sold glazes and frits worth 57.9 million € to Italy, which represents 11.3 % of all exports, while imports from Italy came to 28.5 million €, that is to say, 38 % of the total Spanish imports. If we take the two activities into account, the overall inter-district trade for the year 2004 amounted to 206 million €. Finally, we have also pointed out how the consolidation of the Italian machinery and equipment subsector cannot be accounted for without bearing in mind the Spanish demand in the nineties.

### 3.1 Final considerations

The results outlined in the previous points lead us to one clear conclusion, that is, that the two districts should be considered jointly, even more so if we bear in mind the challenges they

have to face as a result of globalisation. The two districts have to deal with a series of threats that affect the two countries equally. Perhaps the most significant are the need for sustainable environmental development and the competition from China and other emerging countries.

Both districts are the result of their respective specific processes and are backed by institutional networks that each have their own distinguishing features – a situation that grants them a degree of functional autonomy. The level of interdependence and mutual influence they display, however, makes it advisable to perform joint institutional actions and developments that make it possible to take advantage of the benefits of this aggregation. We believe that the new situation requires both districts to acknowledge each other mutually and to progress from a strictly local vision to another on a higher European level in order to be able to tackle the challenges of the future with some kind of guarantee of success. Some comments can be made in this respect.

#### 3.1.1 Mutual recognition

We cannot finish our study without mentioning the scarce consideration the Italians have shown towards Spain as a potential competitor. At least this is what we derive from the fact that Italian researchers, such as Russo, or others who are acknowledged around the world as being experts on the subject, like Porter, have underestimated the Castellón district. The reason for this is that Castellón cannot be analysed from the perspective of being a low-cost country that is not regulated to a sufficient extent (as suggested by Russo <sup>1)</sup> [19]). Neither can we neglect the dynamics of the evolution of the district beyond offering just a snapshot of the situation, as Porter does <sup>2)</sup> [20]. The report by Ballarini [18] highlights the systematic belittling of the Castellón district by Italian firms, and suggests they would do better to work together.

#### 3.1.2 The strategic vision of industrial policy agents

The new competitive context requires a global long-term perspective and, hence, some individual interests have to be put aside. The new model means that some existing firms will have to disappear to leave space for new ones. Although the territory is capable of absorbing the redundant resources and work during the process, consensus, trust and stability are required. Moreover, the number of points of common in-



terest shared by the two countries continues to grow. The idea that might be suggested here is that of progressing from the concept of the industrial district as a local affair to one of a single European district comprising Castellón and Sassuolo.

### 3.1.3 Institutional development on a supranational level

A second suggestion we might make is to change from a regional or national perspective to a supranational approach, at the same time creating and improving common organisational structures such as business associations, university consortiums, and so forth. Within the context of the ideas outlined here, joint projects and trade missions and fairs are particularly important owing to the influence they exert in the promotion and dissemination of innovations. An example of a supranational organisation in the sense we are suggesting here is the case of the European Ceramic Tile Manufacturers' Federation. This supranational organisation can improve the lobbying activities carried out at European Union level in matters concerning common infrastructures, legislation on trade regulation, and so forth.

### 3.1.4 Attention to social capital aspects

Another suggestion would be to create a multi-district community, or social capital [17]. Communities can facilitate the flows of information and knowledge (including tacit knowledge) among different countries, thus ensuring the vertical and horizontal diffusion of innovations and creating a community of people who exchange know-how and experiences [21]. In short, this would involve thinking on a European level. Flows of (especially human) resources among different districts in different countries should be fostered. One such example would be the community of Italian ceramic technicians in Castellón.

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## Note

1) The permissive Spanish legislation on matters concerning the environment has encouraged Italian colouring and glaze manufacturers to set

up plants in Spain, where they cut production costs and inflict harmful effects on the Spanish environment [19]. This description of the firms in the Spanish frit and glaze sector is hard to accept. Most of them are funded with local capital, in a region where environmental regulations and production costs are no longer very different from those found in Italy. This is even more the case in a sector with high added value where labour and production costs are not so relevant.

2) Spain had a certain number of elements of the ceramic sector diamond, especially advantages in the conditions of factors and demand, but there was no underlying base of related and support activities and less rivalry than in Italy. There was no eminent threat to the Italian industry [20]. In contrast to this prediction, at the end of that decade Spain overtook Italy in terms of the number of square metres it produced.

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