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# Rethinking industrial districts in the XXI Century

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# INTRODUCTION

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*Section* INTRODUCTION

Journal of Regional Research Investigaciones Regionales

# Introduction: Rethinking industrial districts in the XXI Century

Rafael Boix, Fabio Sforzi, Francesc Hernández

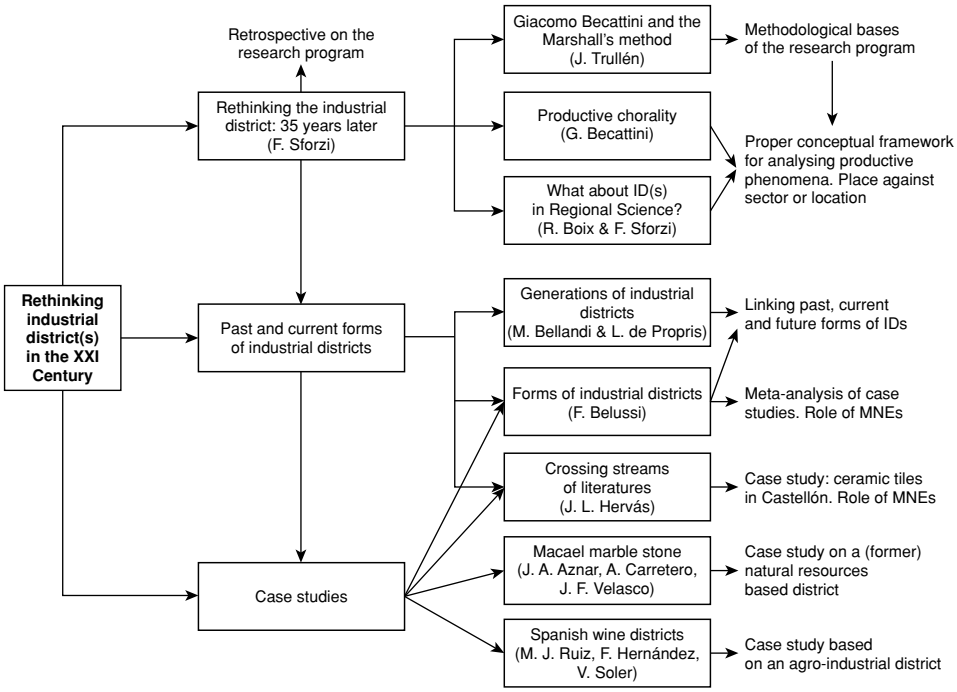
Why a special issue to rethink industrial districts in the XXI Century? This is a good question. In our experience, many scholars and policy makers associate the industrial district with a production system that flourished in the latter half of the twentieth century but is currently outdated. Economists and policy makers do not hide their preference for producing high-tech manufacturing and advanced services rather than shoes, clothes or ceramic tiles. Yet in countries like Italy or Spain, an enormous percentage of trade in added value still depends today on the production of their industrial districts. And do not forget that the first signs of recovery in both economies were detected in the foreign sector, boosted by the exports of industrial districts.

In fact, the new maps of industrial districts being elaborated for Italy and Spain (R. Boix and F. Sforzi, eds., 2016, *The industrial districts in Italy and Spain between continuity and change,* forthcoming) show that in 2011 the industrial districts not only have not disappeared, but still retain a high weight in both economies. However, as expected, they have mutated, changing their shape without changing their essence. It seems appropriate to advance the study of the XXI Century industrial districts and to produce this special issue do it.

All the articles of this special issue have their origin in the celebration of the 35th anniversary of the seminal article «From the industrial "sector" to the industrial "district"», which was written by Giacomo Becattini in 1979 and is considered the origin of modern literature on industrial districts. To celebrate 35 years of the article, we organised three events: the special sessions organised in honour of Giacomo Becattini in the 53rd European Regional Science Association (ERSA) Congress in Palermo, the special sessions on industrial districts hosted by the Spanish Association of Regional Science (AECR) in Oviedo and the yearly Conference of Industrial Districts and Clusters held in Valencia in 2014. In these sessions we have brought together dozens of academics to discuss the industrial district and its changes.

This special issue should be considered a transitional volume. In 2009 Edward Elgar published the monumental *A Handbook of Industrial Districts* (Becattini, Bellandi and De Propris), which collected 56 items to provide a state of the art about the industrial district. Now, we need to move towards a new generation of studies about the industrial district. The articles form a story in three parts. The first part is retrospective, the second is prospective and the third presents singular case studies (Figure 1).

**Figure 1.** Rethinking industrial districts in the XXI Century




The first part of the special issue is introduced by an article by Fabio Sforzi entitled «Rethinking the industrial district: 35 years later». This article presents the evolution of thinking about the industrial district since 1979. The paper identifies three key points in this evolution. The first is the proposal of the industrial district as the unit of analysis (1979). The second is the industrial district as a socio-economic concept and a model of production (1989). The third is the industrial district as a new approach to economic change (2000).

Much of this evolution is condensed in the second article, «Beyond the geo-sectoriality: the productive chorality of places», written by Giacomo Becattini. This article is characterised by its unusual structure, its incisive and ironic prose and the strength of his message. In this article, Giacomo Becattini critically reviews the operational proposal of the Bank of Italy to use as the unit of analysis a mix of sector and geography. Becattini argues that «the starting point for analysis should be the assumption that every place —as defined by a combination of natural conditions and the outcome of history— has at any given time a specific "productive chorality"». With the introduction of this new concept of «productive chorality», Giacomo Becattini again highlights the uniqueness of the place as the unit of analysis.

In the third article of the monograph, «Giacomo Becattini and the Marshall's Method», Joan Trullén analyses the thought of Giacomo Becattini, departing from

the methodology adopted by this author. Trullén's article provides a unique perspective, from the point of view of the philosophy of economic thought, on the importance of the industrial district and the thought of Giacomo Becattini in the study of economics. Under the pretext of analysing the method of Becattini, Joan Trullén inserts the industrial district in the economic and philosophical frameworks of Marshall, Schumpeter and Keynes, contextualising the reality of localised economic processes operating in historical time.

The first part of the monograph concludes with an article by Rafael Boix and Fabio Sforzi entitled «What about industrial district(s) in regional science?». Under the guise of a retrospective article, the authors offer a provocative analysis about the evolution of the main line of thought in regional science and why it does not discover the industrial district but follows the way of the location theory.

Taken together, these four articles deal with a topic of crucial importance in regional science: the proper conceptual framework for analysing productive phenomena. The four come to the same conclusion: the importance of the place and its «productive chorality» against the point of view of the sector or localisation.

The second part of the monograph attempts to understand changes in industrial districts and the differences between them. Lisa De Propris and Marco Bellandi merge some of their recent research in the article «Three generations of industrial districts». The article suggests the existence of different generations of industrial districts, linked to specific conditions and characteristics of each time period. This is another provocative argument, which implicitly suggests the existence of different concepts of the industrial district based on the historical time and place where these districts are studied. However, behind this argument there is the need to understand the changes in the international economic context and the need to understand the industrial district in the current and changing context.

In «The international resilience of Italian industrial districts/clusters (ID/C) between knowledge and re-shoring off manufacturing (near)-shoring», Fiorenza Belussi analyses how industrial districts and clusters are inserted in this new context. This focuses on the points of view of the firm and the place. Once the theoretical framework is introduced, supported by a meta-analysis of case studies of industrial districts for 20 years, the argument is strong: the industrial district is not really as self-contained as has been claimed, but it is increasingly involved in the process of internationalisation, and there is a relevant role of multinational enterprises (MNEs) in the district's relationship with the world. In this process, industrial districts try to recentralise knowledge within the district and relocate manufacturing processes lower added value in spatially close places.

This argument is the starting point of the article by José Luis Hervás: «Why do multinational enterprises co-locate in industrial districts? An alternative explanation from the point of view of the international business and economic geography literatures». In this article, the author explores the relationship between industrial districts and MNEs on the basis of different literature streams: industrial district, economic geography and international business. The paper disentangles and clarifies how

industrial districts have to be analysed by MNEs in order to take advantage of the industrial districts' resources in the co-location and off-shoring process.

The articles by Fiorenza Belussi and José Luis Hervás present case studies of well-known districts. The last part of the monograph presents two lesser known case studies. In the article «An industrial district around to mining resource: the case of marble of Macael in Almería», José Ángel Aznar, Anselmo Carretero and Juan F. Velasco present the evolution of the Macael district mining industrial agglomeration and subsequent polarisation around a local multinational, Cosentino, whose production process is now independent of the natural resource. Finally, María Jesús Ruiz, Francesc Hernández and Vicent Soler present «*In vino veritas*: factors of competitiveness in wine districts», where they analyse the current increase in the production of wine in Spain, concluding that wine producing companies located in industrial wine districts in Spain are more efficient than those located in other places.

Space constraints and the current state of research have left out many issues that we wanted to include. It would be almost as important to write about what is missing in the special issue as it is to write about what is included. However, we hope that the text can be the seed of a new generation of studies on the industrial district.

The coordinators of this special issue want to thank *Investigaciones Regionales* (*Journal of Regional Research*) and the Spanish Association of Regional Science for the proposal to publish these materials. In particular, we thank the work and support of Juan Ramón Cuadrado, Andrés Maroto, Julieta Llungo and Jordi Suriñach. We thank the authors of the articles for their willingness to include their research in this special issue, and the reviewers who have worked to improve the content and presentation of the articles.

# ARTICLES

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*Section* ARTICLES

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# Rethinking the industrial district: 35 years later

Fabio Sforzi *

**ABSTRACT:** The year 2014 marked a double anniversary: the 35th and 25th anniversaries of the publication of two seminal papers of Giacomo Becattini on the industrial district. The first paper (Becattini, 1979) conceptualizes the industrial district as a «unit of investigation», while the second (Becattini, 1989) conceptualizes the industrial district as a «model of production». Between the two papers there is a mutual dependence. The industrial district as a «model of production» deprived of the industrial district as a «unit of investigation» loses its originality as a way of interpreting economic change and becomes merely «one type of a cluster». This paper deals with the relationship between district and cluster, then also between the industrial district as a singular theoretical construct and the many industrial districts described by empirical investigations, and concludes with some remarks on the topicality of the industrial district.

**JEL Classification**: B2; N9; R10.

**Keywords:** industrial district; cluster; regional economics; regional studies; economic history.

## Repensar el distrito industrial: 35 años después

**RESUMEN:** El año 2014 marcó un doble aniversario: los del 35.º y 25.º año de la publicación de dos trabajos seminales de Giacomo Becattini sobre el distrito industrial. El primer artículo (Becattini, 1979) conceptualiza el distrito industrial como una «unidad de investigación», mientras que el segundo (Becattini, 1989) conceptualiza el distrito industrial como un «modelo de producción». Entre los dos artículos hay una dependencia mutua. El distrito industrial como «modelo de producción» privado del distrito industrial como «unidad de investigación» pierde su originalidad como una forma de interpretar el cambio económico y se convierte simplemente en «un tipo de clúster». Este artículo trata la relación entre el distrito y el clúster, y a continuación entre el distrito industrial como un constructo teórico único y los muchos distritos industriales como resultados de

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investigaciones empíricas, y concluye con algunas observaciones sobre la actualidad del distrito industrial.

**Clasificación JEL**: B2; N9; R10.

**Palabras clave:** distrito industrial; clúster; economía regional; estudios regionales; historia económica.

## 1. Introduction

The year 2014 marked the 35th anniversary of what scholars of industrial districts consider the birth of the notion of the industrial district, that is the publication of the seminal paper of Giacomo Becattini «Dal settore industriale al distretto industriale. Alcune considerazioni sull'unità di indagine dell'economia industriale» [From the industrial «sector» to industrial «district». Some remarks on the unit of investigation of industrial economics] (Becattini, 1979). But the year 2014 is also the 25th anniversary of another seminal paper of Becattini «Il distretto industriale marshalliano come concetto socio-economico» [The Marshallian industrial district as a socio-economic notion] (Becattini, 1989). This second paper is considered the starting point for empirical research on industrial districts. Its international popularity among academics and policy-makers has to some extent overshadowed the first paper. However, without the «unit of investigation» introduced in the first paper no meaningful empirical research on the industrial district as a «model of production» can be performed.

The background of the industrial district concept is nestled in the system of thought of Alfred Marshall (1842-1924). However, the *Principles of Economics* (Marshall, 1890) and *Industry and Trade* (Marshall, 1919), as well as *The Economics of Industry* (Marshall and Marshall, 1879), do not provide a definition of industrial district neither as a «unit of investigation» nor as a «socio-economic notion». These books contain many of the elements for a conceptualization of the industrial district, but the industrial district definition remained, so to speak, «in search of an author» until Giacomo Becattini proposed a new interpretation of Marshall's work (Becattini, 1962 and 1975a).

This interpretation made it possible to recognize the potentiality of notions and thoughts spread throughout Marshall's work for defining a new theoretical approach to industrial change. The industrial district as an economic approach conceptualized by Becattini is rooted to a large extent in this interpretation.

The founding papers of the industrial district concept are the two aforementioned Becattini papers. Both papers were written originally in Italian, and so their international popularity only came after their English translation in two books: *Small Firms and Industrial Districts in Italy* (Goodman, Bamford and Saynor, 1989), and *Industrial Districts and Inter-Firm Co-operation in Italy* (Pyke, Becattini and Sengenberger, 1990). In Spain, the appearance of the first paper occurred in 1986 in the *Revista Econòmica de Catalunya*.

The first paper, where the industrial district was conceptualized as a «unit of investigation» of industrial economics, has gained less popularity than the second, where the industrial district was conceptualized as a «model of production». This has been for two main reasons.

The first reason is the conservatism of an academia which has opposed the heterodox idea of replacing the category of industry technologically defined with the industrial district's definition of the category of industry according to the sense of belonging of the human agents of production (employers and workers) to the place where production actually occurs.

Conservative industrial and regional economists have above all been united by the idea that the presence of a given industry in a given place, at a given time, has to be explained through the principles of industrial location (Weber, 1909). But for district economists what matters are not the causes leading to the location of industries, but the causes leading to an industry staying long in a given place (Marshall, 1920), even after the efficacy of initial location causes have died down.

The second reason is the attention given to the industrial district as a «model of production» after the crisis of the Fordist system of production. The industrial district as a model of production observed in Italy, and mapped in 1981, represented an empirical alternative (historically founded), even before its description as a theoretical possibility (a textbook case).

While the identification of the industrial district as a «model of production» was the turning point for the carrying out of applied research on industrial districts, it was the industrial district as a «unit of investigation» which was the precondition for conceptualizing the industrial district as a model of production: the place of living (the Marshallian «economic nation») as the unit of investigation for understanding the economic change that the integration between a «community of people» and a «population of firms», supported by a given «system of values», engenders through an industrial organization which fosters the accumulation, free circulation, sharing and increase of knowledge among entrepreneurs and workers (the Marshallian «external economies»). So, the industrial district as a unit of investigation and the industrial district as a model of production are embedded in one another.

This embedding can be seen in Becattini's 1979 paper where he introduces two Marshallian lines of research: one on «external economies» (Becattini, 1979, p. 15) and the other on «economic nations» (Becattini, 1979, p. 17). Without Becattini's original amalgamation of these two lines of research, and their intellectual reprocessing, supported by the observation of facts (including works on the economic development of Tuscany and also some areas in the region such as Prato: Becattini, 1966, 1969, 1975, 1978 and 1986), in my view the concept of industrial district would never have been born.

This paper is organized as follows. After this Introduction, section 2 addresses the Marshallian industrial district; section 3 is dedicated to the potential hybridization of the concepts of industrial district and cluster; section 4 addresses the relationship

between the industrial district as a theoretical construct (the one) and the (many) industrial district identified by empirical investigations; section 5 concludes the paper with some remarks on the topicality of the industrial district.

## 2. The Marshallian industrial district

Since Giacomo Becattini introduced to the literature the notion of «Marshallian industrial district» (Becattini, 1979 and 1989) a huge number of academic and non-academic works have discussed the concept and its empirical implementation. However it cannot be asserted that this large discussion has resulted in improvements to the concept as it was originally formulated.

Rather, it can be asserted that scholars, mainly English-speaking, referred to one of the sources of the concept, the *Principles of Economics* of Alfred Marshall (1890), in order to bypass the Italian conceptualization of industrial district. The aim was to retrieve first-hand references by citing the most well-known passages of Marshall's work where they believed the definition of industrial district was located. An example of such a passage could be found in paragraphs 2 and 3 of Book IV, Ch. X, of the eighth edition of the *Principles* (Marshall, 1920).

Unfortunately, in that passage the term «industrial district» has a purely descriptive meaning.

This is not to say that the ideas located in Book IV of the *Principles* are not relevant to the conceptualization of the industrial district; quite the contrary. I share the position of scholars, and especially of those who focus their attention on topics of industrial organization, who identify Book IV of the *Principles* as being the core of Marshallian teaching (Raffaelli, 1998)[1].

I simply wish to argue that these ideas are only some of the Marshallian concepts relevant to the definition of the «Marshallian industrial district» as conceptualized by Becattini.

The clumsy attempt to go back to the source has diverted attention away from using the industrial district concept as a means of interpreting economic change (Becattini, 2000) towards its use as a means of interpreting industrial location.

Where the «standard economist» sees reasons for industrial agglomeration (such as the presence of labour pooling, intermediate inputs, and technological spillovers), the «district economist» sees reasons for economic change. The way firms belonging to various sectors relate to one another fosters the accumulation of knowledge and

[1] This reading contrasts with the more traditional interpretation according to which «the core of Marshall's thought is made up of Book V of the *Principles*, where are formulated all the Marshallian theoretical innovations that can be inserted in the strand of marginalism» (Raffaelli, 1998, pp. 144-145). For example, Walter Isard, the founder of Regional Science, who wrote in an age in which this latter interpretation dominated, used Book V as the basis for his harsh critique of Marshall, blaming him for putting the importance of time before that of space, and thereby hindering the spatial evolution of economics (Isard, 1956). On this matter, see Sforzi and Boix (2015).

skills and this serves to glue an industry to a place long after the causes that led to its formation (mainly local forces according to the district approach) have disappeared.

Once the economic advantages of Marshallian localized industries had been identified as determinants of the location of industries (the «agglomerative forces» of Alfred Weber (1909)) it followed that Marshallian external economies should become equivalent to Weberian economies of agglomeration, and that finally the industrial district would be set in the framework of classical location theory.

In this context, it is not surprising the industrial district notion is considered a fuzzy concept (Markusen, 2003), or that an industrial district is treated as an industrial cluster (Porter, 1998).

One of the most cited academic articles on industrial districts: «Sticky Places in Slippery Space: A Typology of Industrial Districts» (Markusen, 1996) has notably contributed to the generation of this misconception.

In her paper, Ann Markusen argues that there are five types of industrial districts, or «sticky places».

Three of these types are wholly alien to the industrial district concept, even to the looser versions of the concept to be found in the secondary literature on the district. These three types are: «hub-and-spoke», «satellite industrial platforms», and «state anchored» industrial districts.

> «The hub and spoke district, where regional structure revolves around one or several major corporations in one or few industries; the satellite industrial platform, comprised chiefly of branch plants of absent multinational corporations [...]; and the state-centered district, a more eclectic category, where a major government tenant anchors the regional economy (a capital city, key military or research facility, public corporation)» (Markusen, 1996, p. 296).

I have nothing to say about the fact that these three types of industrial organization are present in economic reality and that they define the socio-economy of given places, except to point out that «industrial district» is an inappropriate term for defining these models of production. Used in this way, the industrial district idea takes on a purely descriptive meaning, while in the proper district literature the term «industrial district» is associated with a specific theoretical approach.

As for the remaining two types of industrial districts, the «Marshallian industrial district» and the «Italianate variant», the «variant» simply cannot exist because neither does the «original».

There is only one type of industrial district conceptualized as a «Marshallian industrial district» and that is the one that resulted from the original re-reading of the Marshallian system, his social philosophy, and his scientific method, started in Italy in the early 1960s by Giacomo Becattini (Becattini, 1962).

The reasons for the «Marshallian» qualification of the term industrial district as conceptualized from Italian experience have been set out in my foreword to the Italian collection of writings of Becattini on the industrial district (Sforzi, 2000, 21n).

In discussing the introduction to the book *Mercato e forze locali* (Becattini, 1987a) Becattini and I had agreed on the need to qualify the industrial district as

«Marshallian», so that it was unequivocal that the district was not simply a descriptive device for a particular industrial phenomenology, the system of small businesses which even then was rampant in Italy, but was a proposal for a theoretical framework which identified in the «Marshallian external economies» the analytical tool.

For understanding Italian development since World War II the concept of industrial district acted as a «interpretative breakthrough» in that it provided theoretical foundations to understanding places as phenomena where production actually occurs, freeing them from their traditional function of being geographical coordinates or areas for statistical reporting, and in any case being territorial units lacking explanatory significance.

The industrial districts that the district interpretation of Italian development identified in economic reality were not simply replicas of the nineteenth century English industrial districts on which Marshall had worked: the reference to districts being «Marshallian» related to a particular analytical tool, not to an empirical identification. An industrial district can be said to be a «Marshallian industrial district» if it is so identified by empirical research using methodological criteria derived from the Marshallian analytical tool.

The statement that «we can also distinguish two forms of district: one real Marshallian district and another closer to the Italian experience of this post-war period» (Becattini and Rullani, 1993, p. 33) must be interpreted in the sense that among the industrial districts of the current Italian debate there are some districts that have been defined as such by using the Marshall-Becattini analytical tool, while others simply represent a semantic upgrading of a traditional agglomeration of firms.

In her argument against the scholars of the «new industrial district» (NID) literature, Markusen underestimates the importance of Becattini's paper in the book edited by Goodman and Bamford (1989) on industrial districts in Italy, a book which she lists in her reference section. This underestimation is reflected in the fact that although Becattini's paper is not included in the references, other papers in the book are mentioned.

It is clear Markusen was unable to grasp the importance of the mutual dependence between the definition of the unit of investigation and the district model of production —in other words, that the district is a place-based model, because at the core of the model there are people, not firms. Maybe not even the fact she had clearly read —as it is listed in the references— my paper on the geography of industrial districts in Italy, in which the issue of considering the proper unit of investigation is presented as the first step for the empirical detection of district communities, did the matter become clear to her.

## 3. Some disputes over the district

As the industrial district concept spread and became popular in various academic circles, including among economists, sociologists, historians, and management theorists, disputes about various aspects of it arose.

Among the minor disputes which occurred were those focussed on: the mono-sectoral or multi-sectoral nature of the industrial pattern of the district; its degree of self-containment and external openness; matters related to issues of specialization or differentiation of district production; questions of inter-firm co-operation and competition; the ability of district firms to exploit local knowledge while simultaneously exploring new knowledge available outside the district; and evaluations of the district's potential for enhancing local knowledge.

These have only been minor disputes that have often derived from a misinterpretation, or an indirect knowledge, of original sources on industrial districts. Therefore they could be easily resolved by reference to the passages in those sources where the issues are discussed.

However, there have also been some major disputes.

In my opinion, the most challenging dispute has concerned the relationship between «district» and «cluster».

Despite the claims of Porter and Ketels (2009) the concepts of the industrial district and the cluster do not share similar theoretical roots. Moreover, it is not true that «the concept of IDs arose when researchers applied Marshall's original work on agglomeration to understanding the success of flexible (or "neo-Fordist") production systems in the 1980s» (Porter and Ketels, 2009).

What is common to the industrial district concept proposed by Giacomo Becattini and the cluster concept proposed by Michael Porter is that both reject the idea of industry as an intermediate entity between a single production process and the economic system as a whole, or the national economy.

The two scholars have both rejected this approach when, in Becattini's case, explaining the competitive advantage of the Italian region of Tuscany, in its economic development from the end of World War II to the early 1970s (Becattini, 1969 and 1975b), and, in Porter's case, when discussing, more generally, the competitive advantage of nations (Porter, 1980).

Becattini proposed to replace the concept of «industry», traditionally defined according to the criterion of the production technology used, with the concept of «industrial district», defined according to the sense of belonging of the human agents of production (employers and workers) to the place where production actually occurs.

This approach does not distinguish industries «along the separator lines of the production technology» (*i. e.,* according to the standard statistical classification) (Becattini, 1987b, p. 29). Rather, it shifts the focus onto the organization of the production process, that is to say the way firms belonging to industries that are technologically different co-operate in a place (the district) to actualize production.

However, what is being referred to is not a mere jumble of industries, since it is possible to distinguish between a main industry and auxiliary industries, and between activities focused on manufacturing and those dedicated to business services. The result is a place that is «technologically multi-sectoral», engaged in production that is differentiated in terms of the range of various goods produced by the main industry;

and also by the different products produced by the firms belonging to the auxiliary industries on behalf of firms of the main industry, but which are sold not only to local firms but also outside the local market.

In his research Becattini engaged in theoretical thinking about the concept of industry, leading him to critically examine the positions of various economists on the subject (Becattini, 1962). For this purpose, he identified the different ways industry could be classified, including, for example, the satisfaction of needs, technological similarity, and the sense of belonging. This process was then the prerequisite to the next stage of his theoretical thinking, namely that focused on the problem of what should be the «unit of investigation» of economic research (Becattini, 1979).

Over the span of time 1962-1979 Becattini completed two studies on the economic development of Tuscany (Becattini, 1969 and 1975b), and also a new interpretation of Marshall's work (Becattini, 1975a). His approach was to use the method of investigation: abstract-concrete-abstract, whereby «theoretical thinking» is combined with the «observation of facts» in an iterative process of investigation of economic, or, rather, social reality.

In the context of Italian economic development since the end of World War II, the so-called «glorious thirty» years, the economic development of Tuscany represented an anomaly.

The regions of Northern Italy followed a path of industrial development in keeping with the classic model of industrialization, characterized by: growth of firm size, vertically integrated production processes, the development of internal economies of scale, and the occurrence of mass production for mass consumption.

Tuscany, instead, followed a different path to industrialization. This occurred «without vertical integration» (Becattini, 1978), and was characterized as being dominated by the proliferation of small firms. These small firms were located at different phases of the same production process. Overall, the firms participated in a production process that was differentiated by the types of goods produced, by the various parts of goods made, and by a division into phases of production. The whole was held together by flows of place-based external economies. The firms produced small batches of customized goods designed to satisfy the desire by demanding customers for variety and social distinction.

The economic performance and the social well-being produced by the Tuscan model of development contested the accepted notion that there was «one best way» of organizing production in general, or during the «glorious thirty» in particular. The model of «district industrialization» that had been observed in Tuscany, on the one hand served to rebut the view of economic development as a linear process: first, craft production; then vertically integrated production in one factory; finally, flexible specialization as a result of processes of vertical disintegration of the factory (the so-called «post-Fordist» system of production, with which industrial districts have been associated); while on the other hand it provided the economic background to the interpretation of the Third Italy (Bagnasco, 1977).

This system of differentiated production and inter-firm specialization —where firms are mainly small-sized because they are «firms of phase»— occurred in industries which allowed such a development to occur, namely: personal and household goods, and related and supporting industries (*e. g.,* chemicals, plastics, and specialized machinery).

The way the manufacturers look at the market is «the salient distinction between differentiated production and mass production» (Jacobs, 1969, p. 238).

In the words of Jane Jacobs, «A mass-production manufacturer seeks common denominators in the market; he exploits similar needs. A differentiated-production manufacturer depends on differences to be found in the market. He deliberately exploits the fact that people have different tastes in styles, fabrics and colors, differing clothing budgets and, as individuals, reasons for needing diverse clothing (*e. g.,* garments for going to parties, lounging, sports, work, city activities, country activities). The two different approaches to the market give rise to other distinctions between mass production and differentiated production. Mass production churns out far greater numbers of identical items than does differentiated production. Much more design and development work goes into differentiated production than into mass production, in proportion to the volume of output» (Jacobs, 1965, pp. 238-239)[2].

The study of the economic development of Tuscany provided the elements for defining the industrial district as a path to industrialization, focused on Marshallian external economies, which was an alternative to the classical path of industrial development (or «Fordism», according to the term widely used to summarize such a path), based on internal economies.

The Tuscan model of development paved the way for conceiving the industrial district as a «socio-economic concept» (Becattini, 1989)[3].

While Becattini proposed to replace the category of «industry» with that of «industrial district» —a socioeconomic territorial unit where the values of a local community support the industrial organization of a population of firms characterized by differentiated production, as well as by a specialization in specific production phases— Michael Porter proposed to replace the category of «industry» with «cluster of industries». As a first step, he described the cluster as being composed of «industries connected through vertical (buyer/supplier) and horizontal (common customers, technology, distribution channels, etc.) relationships» (Porter, 1990, pp. 73 and 149). This he proposed after having said that «the basic unit of analysis for understanding national advantage is the industry» (Porter, 1990, p. 73).

Then Porter updated his definition by introducing the idea of geographical proximity, the role of which he had already emphasized in *The Competitive Advantage of*

[2] On the relationship with the market for small-batch production compared to mass production, see also Woodward (1965).

[3] The study of the economic development of Tuscany was the main line of empirical research that contributed to a defining of the district as a socio-economic concept, but an important role was also played by two other lines of empirical research: research on industrial localization in the province of Lucca (Tuscany), and a twenty-year study of the economic development of Prato (Becattini, 1966 and 1997).

*Nations* when talking about geographical concentration (Porter, 1990, pp. 154-159): «Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also cooperate» (Porter, 1998, pp. 197-198).

There is good reason to believe that this «geographical turn» in the conceptualization of the cluster —which occurred between 1990 (the year of publication of *The Competitive Advantage of Nations*) and 1998 (the year of publication of *On Competition*)— was influenced by the international spread of the industrial district concept.

In *The Competitive Advantage of Nations* (Porter, 1990) there are no references to the works of Becattini, but in Chapter 7 of *On competition*, which explores the concept of clusters (Porter, 1998, pp. 197-287), there are references to Becattini's article «The Marshallian industrial district as a socio-economic notion» (Pyke, Becattini and Sengenberger, 1990, pp. 37-51), and also to the book *Mercato e forze locali: il distretto industriale* (Becattini, 1987).

Maybe it was the discovery of the Marshallian industrial district that led Porter to enlist as an intellectual antecedent to cluster theory Alfred Marshall, who, says Porter, «included a fascinating chapter on the externalities of specialized industries locations in his *Principles of Economics*» (Porter, 1998, p. 206). And so he concludes that among other studies focused «on geographic concentration of companies operating in particular fields, which can be seen as special cases of clusters» there are «Italian-style industrial districts of small and medium-sized firms dominating a local economy [...] in some types of industries» (p. 206).

The identification of Alfred Marshall as the historical and intellectual antecedent both of the cluster and of the district has led scholars of management to hybridize the two concepts. A consequence is that such scholars glean knowledge on the genesis and evolution of local economies equally from the literatures on industrial districts and clusters (Belussi, 2015; Hervás, 2015).

There is nothing wrong with this hybridization, except that the unit of analysis should not be a mere geographical concentration of industries, but a place defined by the relationships between the people who live there and the economic activities in which they engage, both as entrepreneurs and workers. But this is still not enough. Study of the evolution of such a place of living should include not only economic changes but also social ones.

The success or decline of a given local economy, at a given time, may depend on changes in a local population's system of values —leading, for example, to a loss of entrepreneurial spirit— rather than on, say, competitive pressure from other local economies in domestic or international markets.

To neglect the changes affecting people (the «community of people») and to think about only changes affecting industries (the «population of firms») means imparting an economic curvature to a district/cluster which is a socio-economic entity by definition.

The creation of a kind of hybrid concept drawn from both the ideas of industrial district and cluster results in scholars only utilizing a part of the two types of concepts» meanings. Scholars should be aware of this theoretical limit, and should make this explicit in the preliminary remarks of any empirical study. Then, they should also clarify that the conclusions reached at the end of a study are partial, and that an explanation of the causes of change of a given district or cluster which are merely economic might even be misleading.

After all, a decent academic paper always concludes by indicating the limits of a study albeit that attempts to remove or overcome these limits rarely follows in subsequent works. An interdisciplinary perspective, such as characterizes that held by people who draw on an integrated concept of district and cluster, is one that is difficult to pursue in the academic field, especially when this way of approaching study of economic phenomena harms the scholars who practice it.

At this point an unavoidable question arises: What about people in the notion of the district/cluster?

According to the aforementioned definitions of the cluster (Porter, 1990 and 1998), it is apparent that people (the local community) is the missing component, unlike in the case of the definition of the industrial district[4].

The hybridization of the two concepts is a worthwhile initiative if it leads to a mutual enrichment: understanding the role of people, and their system of values, for the cluster perspective; understanding the role of associated institutions (for example, universities), and their support for increasing knowledge, for the district perspective.

A partial hybridization that leads to a disregard of the local community would remove from the district one of its basic specificities, reducing it to merely a form of agglomeration of small and medium-sized firms operating in a specific range of light manufacturing industries. Ultimately, the industrial district would be reduced to «one type of a cluster» (Porter and Ketels, 2009, p. 181), and therefore the initiative of hybridization would fail.

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[4] The current definition of cluster is that provided by Porter in 1998, as reported in Chapter 14 of the *Handbook on Industrial Districts* (Porter and Ketels, 2009, p. 173; Becattini, Bellandi and De Propris, 2009). However, there are other definitions. According to *The Cluster Policies Whitebook* (Andersson *et al.*, 2004) there are subtle distinctions between the concepts of «cluster», and «industrial cluster». There is also a definition provided by Michael Enright, the scholar who «served as the overall project coordinator» of the work later published as *The Competitive Advantage of Nations* (Porter, 1990, p. xvi), which is as follows: «A "localized cluster" or "regional cluster" (Enright, 1992 and 1993) is an industrial cluster in which member firms are in close geographic proximity to each other. A more inclusive definition is that regional clusters are geographic agglomerations of firms in the same or closely related industries» (Andersson *et al.*, 2004, p. 215). The *Whitebook* also gives a definition of the industrial district which although it does not coincide with the canonical definition, it nevertheless grabs the meaning and highlights the difference with the above definitions of cluster: «Industrial districts are concentrations of firms involved in interdependent production processes, often in the same industry or industry segment, that are embedded in the local community and delimited by daily travel to work distances» (Andersson *et al.*, 2004, p. 214).

## 4. The district between the one and the many

The «Marshallian industrial district» conceptualized by Giacomo Becattini has been used by historians as a conceptual framework for re-reading the presence of industrial districts at different ages of industrializing Europe, including the pre-industrial period (Daumas, Lamard and Tissot, 2007; Guenzi, 2009).

Until Becattini gave the subject theoretical status, the presence of industrial districts passed unnoticed, or they had not been considered important because the district was seen as a «weak» productive model (Colli, 2009), obscured by the dominant model of the different ages.

Maybe people's memories have forgotten that even in the 1970s the «Third Italy», where some of the industrial districts occurred, was defined as a «peripheral economy», the «central» one being the «First Italy», namely an economy composed of big companies, large-scale production and capital-intensive industries (Bagnasco, 1977).

Interest in industrial districts changed after the onset of the crisis of mass production and the vertically integrated large company (in a word, the crisis of Fordism). Afterwards, the districts, offering a model of industrialization appropriate to a high wage industrialized economy such as Italy, became seen as a viable way out from Fordism.

In the words of Frank Pyke and Werner Sengenberger (1990, p. 1): «Whilst economies all over the world in late 1970s and 1980s set into recession and stagnation, frequently accompanied by serious deteriorations in labour and social conditions, rising unemployment, and insecurity, a few localities stood out as exhibiting a remarkable resilience and even growth. They were engaged in a variety of industries, and included not only advanced sectors but also more traditional, labour intensive ones, and thereby posed a challenge to those who have argued that such economic activities can no longer succeed in high wage industrialized countries. [...] Many of these [localities] were said to have sufficient similarities in their mode of economic operation to permit them to be categorized under a generic heading: "Industrial Districts". [...] Whilst the validity of other areas in other countries to be called districts might sometimes be contested, the eligibility of localities in Italy is undisputed»[5].

Academics and policy-makers began to take seriously the industrial districts and their policy implications, including the question of their replicability.

Among historians «It is now accepted the idea that the ID [...] is the result of a long and enduring historical process, in many cases dating back to the age before the first industrial revolution» (Colli, 2009, p. 59).

Over the long run of history the industrial districts have emerged, grown, declined, re-emerged, and above all changed in different European countries, adapt-

[5] The book *Industrial districts and inter-firm co-operation in Italy* was a product of research carried out on the subject since 1987 under the auspices of the «New Industrial Organisation» programme of the International Institute for Labour Studies (IILS) of Geneva. If the book *Mercato e forze locali* popularized the industrial district concept in Italy (Becattini, 1987a), the IILS book played the same role in the rest of the world. Its translation in Italian (1991) greatly contributed to bringing the social sustainability of industrial districts to the attention of the public and policy-makers.

ing each time to socio-economic and institutional changes (including in respect of technology, politics and policies, social customs, and the rise of new industrialized countries) to which sometimes they have in part themselves contributed.

It is difficult to say how many «generations of districts» have followed one another from the age before the first industrial revolution to today. Historians who have studied specific industrial districts in different European countries, such as England, France, Germany, and Italy, have differed in the time frames they have covered (Fontana, 1997; Sabbatucci Severini, 2001; Guenzi, 2014). A remarkable collection of studies on *Les territoires de l'industrie en Europe* [The territories of industry in Europe] (Daumas, Lamard and Tissot, 2007) indicates a relevant time frame to be the whole period of European industrialization (1750-2000). Therefore, the issue of how many generations of districts have occurred remains an open question.

In my opinion, without an actual observation of facts through a series of case studies (carried out through archive research or by a careful scrutiny of the relevant literature), and/or the provision of other reliable information collected through an appropriate methodology (such as in the way industrial districts are identified and statistical data collected), any attempt to assess the number of generations of industrial districts must be arbitrary (Bellandi and De Propris, 2015)[6].

The industrial districts detected in Italy (Becattini, 1990; Sforzi, 1990) were gradually recognized to also exist in other European countries, either historically (Judet, 2007) or currently (Ganne, 2000; Boix and Galletto, 2004; De Propris, 2009) —although there have been historians who have claimed that the districts are «the product of a singular and therefore unrepeatable history»: Italy's industrialization (Zeitlin, 1992, p. 279)[7].

The identification of districts in other countries, beyond Italy, means that the districts have formed and changed in different socio-economic and political-institutional contexts at different times, assuming different specific forms (the «many» of facts), but they are explained through the same concept (the «one» of theory).

I do not wish to give the impression that I'm saying that while the «district-facts» may change the «district-theory» must be fixed.

In industrial districts, changes take different paths and are affected by different factors, at a given time, within an institutional space. The institutional space in which districts are embedded includes supranational, national, and regional institutions,

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[6] In Italy, for some years there have existed active «observatories on industrial districts» (*e. g.,* the National Observatory Italian Districts, supported by the Federation of Italian Districts, and the District Monitor of Intesa-San Paolo, supported by the namesake bank). They claim to provide information on the new frontiers of change in industrial districts. The collected data are derived from surveys applied to a list of districts defined by criteria of membership to the association that produces the report (the Observatory), or to other unknown districts, and the data is confidential (the Monitor). In light of all that, it is hard to give credibility to the measurements of district changes provided by these institutions.

[7] Outside Europe, of note is the case of Providence (USA) investigated by Francesca Carnevali in a remarkable paper where she compares Providence and Birmingham (UK), two jewellery making districts, in respect of issues of knowledge, trust, and cooperation (Carnevali, 2007). Also, in the late 2000s, the district was used as a key-concept for interpreting the evolution of «craft villages» in Vietnam (Nguyen, 2009).

their relationships and reciprocal conditionings, and their power for designing policies which directly or indirectly are able to influence district performance.

Saying the above is not to forget the importance of the economic space, that is the varieties of markets in which districts operate, including the range and quality of goods they produce and needs they fulfil, and the competition they face.

An analysis of the determinants of district change should address processes such as: the progressive division of labour of the district's main production activity; the formation of local phase-markets; the influence of formal and informal institutions (ranging from business associations to norms); the integrating of internal and external knowledge, that is the way in which district firms are able, or not, to simultaneously exploit existing local knowledge while exploring the new opportunities offered by external knowledge (which is called organizational ambidexterity); the formation of versatile agents who can interconnect the different internal specializations within the district with the external markets; the building or dissolution of trust relationships and a sense of belonging; and the existence of social mobility and formation of entrepreneurship (Becattini, 1998).

In order to produce a synthesis of such processes at work it is necessary to make factual observations of a number of specific districts (grouped by country or region, because there are national and regional paths of district change, see Sforzi and Lasagni, 2014). Research and analysis should be carried out both in the field and at the desk, making use of any relevant official statistics. Preferably, field and desk research should be practised as an iterative process between observation and theory, and should include the making of comparisons between countries or regions. This circular iterative process of theory-observation-theory could lead to the updating of the concept of the industrial district.

On the other hand, the synthetic analysis could lead one to conclude that some districts have left behind their earlier «district form» and that they now correspond to a different socio-economic model, with the implication that calling them industrial districts would be stretching the concept.

In the economic literature there have been identified other forms of socio-economic organization of production or local development models into which such «former districts» could be assimilated. An example of a different model is François Perroux's concept of growth pole (Perroux, 1955). Industrial districts might change into a different model when, for example, district changes, among other shifts, increase the number of firms taking a financial form, or maybe result in enterprises which grow to a size which is «out of scale» (Becattini, 1989)[8].

[8] District changes could also take different paths. Some industrial districts can decline and eventually disappear: these might include, for example, industrial districts located in marginal regions that have not been able to grow by seizing opportunities offered by globalization because of a lack of infrastructure or appropriate policies; industrial districts that have been affected by the off-shoring of firms belonging to their main industry, resulting in a situation where the previous social conditions supporting the local accumulation of skills and entrepreneurship are irretrievably lost, thereby preventing district revitalization.

So far, amongst the studies on industrial districts there has not occurred the circular process theory-facts-theory that would justify a «real change» of the district concept. Rather, there has been a broadening of the district concept «through the wider notion of Localized Production System (LPS)» (Courlet, 2006, p. 15). However, «In these further enlargements of the field of research, the industrial district loses its theoretical rigor, particularly as regards its economic homogeneity and the socio-cultural characteristics on which is founded» (Courlet, 2006, p. 20).

Finally, we should point out that the observation of facts should be carefully undertaken through the lens of district theory in order to avert a situation where a «revised» concept of the industrial district is nothing but a mere generalization of the facts.

## 5. Some final remarks

The dissemination and propagation of the industrial district concept have required a continuity of application in terms of both theoretical analysis and empirical research, involving the crossing of disciplinary boundaries (as happens for all groundbreaking ideas), resulting in 2009 with the publication of a handbook on the subject (Becattini, Bellandi and De Propris, 2009).

Academics who want to study economic change through analysis at the territorial level, whatever the discipline to which they belong, use the industrial district as a benchmark. Their purposes can range from investigating a specific local business community, to analyzing regional change, to addressing issues of local development.

It is true that in case studies where the object of analysis has been the geographical concentration of industries, the concept of industrial district has been associated with other concepts such as cluster and local production system. But this reference to industrial districts in such contexts does not lessen its significance. Rather, it is proof that these broad concepts have failed to remove the industrial district from its place as one of the key-concepts of economic research (Bellandi and Caloffi, 2014; Blim and Goffi, 2014; Dei Ottati, 2014; López-Estornell, Tomás-Miquel and Expósito-Langa, 2014; Madruga-Torres, 2014; Basile, Donati and Pittiglio, 2015; De Pablo Valenciano and Uribe Toril, 2015; Ferragina and Mazzotta, 2015; Miramontes Carballada and Alonso Logroño, 2015; Pradhan and Das, 2015; Toccaceli, 2015).

Substantive support for the consolidation of the industrial district both as an object of study and as a tool of industrial policy has come from mapping. The mapping has highlighted two aspects: *a)* that there is a possibility to identify industrial districts in the social reality of a country, not only of a region, through a quantitative approach that is consistent with theoretical assumptions and which is based on replicable criteria —as has been shown first for Italy, then Spain, and later Great Britain; *b)* that industrial districts are not an unrepeatable phenomenon associated with a specific stage of Italian industrialization, but rather their presence in the Italian national economy is a continuing structural feature, providing thereby an opportunity to observe their continuity and change (Sforzi, 1987, 1990, 2007 and 2009; Brusco and Paba,

1997; Sforzi and Lorenzini, 2002; Istat, 2006; Boix and Galletto, 2004; Boix, 2009; De Propris, 2009; Boix *et al.*, 2015).

In respect of the matter of public policies to support the competitiveness of specific industrial districts, or to foster a national competitive advantage by leveraging the growth of industrial districts, we can see that the enthusiasm of the 1990s and the first decade of this century have suffered a setback.

I do not feel that the cause of this loss of thrust in industrial district policies lies in the Eurozone crisis, which has served to amend the agenda of priorities of governments. Rather, I think it should possibly be associated with the dominant neo-liberal leanings that deny the necessity of an industrial policy. However, there do not yet exist reliable studies that provide documentary evidence to support this feeling.

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*Section* ARTICLES

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# Beyond geo-sectoriality: the productive chorality of places *

Giacomo Becattini **

**ABSTRACT:** This article discusses the question of what should be the proper conceptual framework for analysing productive phenomena. The cause for reflection on this topic stems from a proposal made by researchers from the Bank of Italy (Alampi *et al.,* 2013) to analyse productive phenomena through the lens of an integrated geographical and sectorial perspective. The author proposes a reversal of the approach, arguing that the starting point for analysis should be the assumption that every place — as defined by a combination of natural conditions and the outcome of history — has at any given time a specific «productive chorality». This productive chorality is not merely derived from the technical, spatial, and cultural proximity of businesses, but also, and more importantly, from the cultural homogeneity and congruity of all the inhabitants of that place, who contribute, positively or negatively, to local production.

**JEL Classification**: B31; L11; R11.

**Keywords**: industrial district; geo-sectoriality; productive chorality; local development.

## Más allá de la geo-sectorialidad: la coralidad productiva de los lugares

**RESUMEN:** El tópico discutido en este artículo es cuál debería ser el marco conceptual adecuado para analizar los fenómenos productivos. La causa para reflexionar sobre este tópico deriva de la propuesta hecha por algunos investigadores del Banco de Italia (Alampi *et al.,* 2013) de recurrir al concepto de «geo-sectorialidad productiva», i.e. una clasificación mixta, geográfica y sectorial, de los procesos productivos. El autor propone un cambio de enfoque, sosteniendo que el punto de partida para el análisis debería ser el supuesto de que cada lugar —definido por sus condiciones naturales y el devenir de su historia— tiene su propio grado de «coralidad productiva» en cada momento dado. La coralidad productiva no se basa meramente en la proximidad técnica, espacial y cultural de las empresas, sino

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también y más importante se basa en la homogeneidad y congruencia cultural de todos los habitantes de este lugar, que contribuyen, positiva o negativamente, a la producción local.

**Clasificación JEL**: B31; L11; R11.

**Palabras clave**: distrito industrial; geo-sectorialidad, coralidad productiva; desarrollo local.

## 1. Introduction

In a recent conference on «The transformation of local production systems», organized by the Bank of Italy together with the Department of Economics, University of Bologna, researchers at the Bank of Italy (Alampi *et al.,* 2012) coined the term «productive geo-sectoriality» to refer to the possibility that certain production processes may be affected by combined sectorial and territorial influences. This new conceptual framework would make it possible, in their view, to develop the economic reasoning essential to understanding aspects of post-Fordist modernity, especially, but not exclusively, in the Italian context.

The proposal goes, in my view, in the right direction, but it also raises, I think, some problems, which I am going to discuss.

## 2. A quantitative test of the district-effect

Let us make a necessary step back. In the early 1990s, Luigi Federico Signorini, a regular visitor to the *Incontri sullo sviluppo locale di Artimino* (Becattini and Sforzi, 2002), had doubts about the validity of the *totem* honoured there: the concept of the «Marshallian industrial district».

The widespread belief amongst Artimino participants in the virtue of the industrial district could not but irritate a researcher like him, someone from the strict Research Department of the Bank of Italy. In short, Signorini suspected that behind the discourse about the industrial district was concealed a defence of the perverse myth of «small is beautiful».

In fact, something like that was indeed contained in the discourses on the industrial district, but not in the sense that enterprise smallness in itself gave competitive force to the district. Rather —as we realized later— the competitive force came from the «intimacy of ties». You should not say, therefore, «small is beautiful», but, rather, «intimate is beautiful».

Signorini, then —as he confessed later— pursued the goal of demonstrating that the deity honoured at Artimino existed only in its cult followers' fantasies.

However, just as when the Prophet of Israel was commanded to curse his people, but out of his mouth came only words of blessing, so Signorini, after carrying out

several attempts of statistical testing, had to recognize that the salvational virtue of the districtual divinity was, on the whole, confirmed (Signorini, 1994). Thus was born, in the halls of the Villa Medicea at Artimino, a strand of studies and ideas, to which the current formula of «geo-sectoriality» can be added (Sforzi, 2007).

## 3. Theoretical thinking and observation of facts

One more step back. I arrived at the concept of industrial district —the «cause of the scandal»— via a dual route:

— by intuition, so to speak, through a study —unbiased to the extent possible for a professional economist in the 1970s (only those who lived those years of scientific and ideological struggle can understand fully)— of post-war Italian industrial events, especially those occurring in Tuscany (Becattini, 2007);
— theoretically, based on studying Marshall and, in particular, his *Economics of Industry* of 1879, and also the 19th century English industrial context (Becattini, 1975).

It has to be added that Sebastiano Brusco, along with his Modena associates and American interlocutors (Charles Sabel & Co.), had also come to recognise the significance of the industrial district phenomenon, through ways that were complementary to my own, but different, pivoting in his case on productive flexibility (e.g. using numerically controlled machines) required by post-Fordist economic affluence, instead of through the productive integration of a plurality of firm processes (Brusco, 1989).

Obviously, I welcomed the «scientific confirmation» of Signorini with understandable satisfaction, to the extent of hosting his study in the first issue of the journal *Sviluppo Locale* (Becattini and Sforzi, 1994).

## 4. The constituent period of district studies

And now, let us make a side step! The constituent period of the strand of studies on industrial districts (1978-1990) variously intertwined with studies on clusters by Michael Porter (Porter, 1990) and also with the birth of the so-called New Economic Geography (NEG) by Paul Krugman and associates (Krugman, 1991).

This convergence of three distinct strands of research (industrial districts, clusters and NEG) have produced many studies, all intended to better ensure the presence, and to better measure the importance, of the territorial concentration of productive activities, examining, in short, the equivalent of the district-effect of Signorini in the most disparate historical and geographical contexts.

For example, more recently, a comprehensive district-oriented set of works and critical analysis can be found in the *Handbook of Industrial Districts* (Becattini *et al.,* 2009), wherein eighty scholars from all parts of the world provide an overview

—certainly incomplete, but already impressive— of the multitude of researches fed by this rethinking of economic analysis.

Despite the large number of studies on industrial districts, clusters and NEG, the vision of the production process as being carried out mainly inside an individual enterprise, or even inside an individual factory, has been, in the vast panorama of economic studies, clearly hegemonic. The proximity towards one another (or alternatively remoteness) of local firms involved in a given industry, appears in the aforementioned economic studies only as an additional feature, quite casual, and therefore negligible at the purely theoretical level.

## 5. Marshallian digression

Let me make, at this point, a brief digression. The inclusion, by Alfred and Mary Marshall, of the industrial district concept in the toolbox of the economist, is due, to one quarter part, so to speak, to their re-elaborated version of the strand of thinking on history headed by Henry S. Mayne (1871) at Cambridge University; to a second quarter to the Marshalls' acceptance of the Spencerian «logical machine», according to which social evolution would experience alternating trends towards more, or less, specialisation and integration (Spencer, 1863); to a third quarter to the idea of «construction of territory», e.g. as realized in the *Isolated State* of Von Thünen (1875), which exerted so much influence on the economic education of Marshall; and lastly, to a final, but decisive, quarter to the direct observation, by the Marshall couple, Alfred and Mary, of the forms of industrial development in the English Midlands in the 1870s (M. P. Marshall, 1947, p. 43).

It is thanks to the influence of these four cultural impulses that Alfred and Mary Marshall conceived the idea of industrial district as a category directly useful for explaining the English industrial phenomenology of their time. We must add, however, that the Marshall of the *Principles of Economics* (1st ed. 1890, 8th ed. 1920) is less explicit about the above influences.

## 6. Productive geo-sectoriality: yesterday and today

It is at this point in history, that is, now, that —after more than a century— appears the contribution of the researchers of the Bank of Italy, who consecrate the culmination of several years of internal reflections in the Research Department of the Bank by proposing the term «productive geo-sectoriality». This refers to the idea that territorial proximity of firms belonging to the same sector has a positive effect on the production process, reducing its unitary cost. This what you might call a Solomonic solution claims that certain sector-place combinations lie behind the competitiveness of production processes. These scholars, clearly, do not want to give up the firm as the unit of production, but at the same time they want to incorporate the district-effect.

The economics profession has rediscovered a truth detected and made explicit in 1906 by a student of Marshall, D. H. MacGregor who wrote: «Such organization can fairly be called «collective» in regard to production; for although each firm or establishment remains independent as to its internal affairs, yet all firms make common use of certain trade economies whose force is greatly increased by centralization [...] these economies and means are external to any firm, but they unite it in a positive cooperation to other firms». And he closed: «The cost of production of an individual establishment depends on other establishments, in a manner which implies three variables. It is a function of the general industrial organization of the country, of the organization of a particular trade, and of the organization of a special centre for that trade» (MacGregor, 1906, pp. 26-27).

The solution that we are now being offered with the introduction of the concept of geo-sectoriality is one of a sectoriality sensitive to spatiality. And this is so not only because of the irrelevance of transport costs in the concerned area, but also because of the manifold effects of an operational proximity and its influence on the unitary cost of production typical of the area.

The proposal of the scholars of the Bank of Italy is certainly interesting and, in my opinion, correct, but perhaps misses a crucial point revealed by industrial district studies, which is that the «plus» of productivity provided by the industrial district does not derive from mere spatial proximity (the proper sense of the geo- of the definition) of firms in the same industry, but from the formation of a «special production environment». Production is embedded in the local production community as a whole (including families and other institutions) and it is through the interactions between the special production environment and the «internal production environments» of individual businesses that the district-effect is produced.

We thus find ourselves talking about the Marshallian «industrial atmosphere», which Krugman, by rejecting the idea of «non-monetary external economies», attempts to exorcise, but which theorists of districts and clusters, on the contrary, are happy to use, albeit in a different way and with a different awareness.

## 7. Reversing the interpretation

The writer of this article believes the causal sequence should be reversed. The production of any good —which involves what is done in the factory and what is done in a place in hours formally free from work— is, ipso facto, social. I propose to conclude the long march «from the district-effect to geo-sectoriality» by reversing the interpretation. Instead of starting from the idea that labour productivity depends on the sector —an elusive and indefinable entity, strictly speaking, as I tried to show half a century ago (Becattini, 1962)— and is then influenced by the proximity of the firms, we say that it depends on the local environment in which the firm operates jointly with the techno-commodity characteristics of the productive process. These features may be more or less sensitive to the effects of enterprise proximity in a territory.

A clear example of what I mean by labour productivity being in part dependent on the local environment can be seen in the industrial district of Carrara marble, where the fate of the marble, in all its dimensions, pervades the minds of all the inhabitants, making it almost a secular religion. What happens to the marble is determined, in part, by the culture of the local people.

The conclusion I reach is that the correct starting point for productive analysis should be that every place, as fashioned by Mother Nature and also by the events in its history, has, at any given time, a degree of —so to speak— «productive chorality», based not only on the technical, spatial and cultural proximity of the firms, but also, and more so, on the strength of the uniformity and congruity of the culture of the people and families who live there.

In other words, I say all the inhabitants of a place are always engaged «chorarly» (aware or not) in the production of things for local consumption, and things for sale abroad. This assumes that some of them do not always participate, explicitly, in the productive effort, just as some choir members who —in a certain interval— while not singing are still participating in the choir.

## 8. Productive chorality

My idea of productive chorality, barely sketched, is something constituted by a thousand institutional figures (ranging from families to firms to local government to religious rituals, and more) and by «cultural» entities (e.g. para-productive institutions, social care provision, sports activities, and more), the total making up a cultural background (in the anthropological sense), and from which depend and on which also are projected, people's individual decisions, including economic ones.

That to be explained by cold «geo-sectoriality» is therefore understood here rather as the economic effect of a warm «civil and productive chorality», often present —although in varying degrees— in the social life of places of production. Is it not logical —I wonder— to imagine that all the inhabitants of a place contribute, positively or negatively, in every moment of their daily lives, to local production (a little like all the choir members, even those who are silent, contribute to the choir)? Of course, a member's contribution can be zero or be negative (the wrong note!).

My proposal may seem trivial: a terminological innovation as simply a verbal expedient aimed at encouraging the reader to not forget the historical and geographic placement of production processes, as, unfortunately, tends to be typical of the «representative economist» of our times, which results, as everyone knows, in the location of analysis in a perspective which is first of all, or purely, sectoral.

But when it comes to defining the so-called «industrial sector», on whose thin shoulders rests so much of current economic discourse, we are faced with insoluble classificatory problems, such as whether the manufacture of rubber boots should be classified as belonging to the footwear industry or to that of rubber? Or we see reference to a «luxury goods sector» which encompasses diamonds, luxury class automobiles,

«exclusive dress designs», sea cruises, and more. Such diversity in rationales for classification undermines the value of any conclusions to be drawn from sectoral analysis.

## 9. Going beyond the sector

So, with what can we replace sector, a category which has been employed in ninety percent of the studies of industrial economics?

Let us first consider the nature of the problems «the sector» was called on to solve: to isolate, to study *in vivo*, a set of production operations characterized by a common strain of knowledge and/or aimed at meeting a certain need or group of needs. Such definition is easy to say but harder to operationalise, due to the elusive and ever-changing problematic of needs, or to an inherent instability of the production mix, especially in today's society.

Question: should a sector cover all firms producing goods that meet a certain type of need, e.g. the footwear industry; or all firms who work a certain raw material, such as, for instance, the rubber industry? I do not have an answer.

I will not belabour the point but I will just say that «simple classifications» do not lead to the goal of an efficient allocation of firms to appropriate sectors when all conceivable configurations of productive phenomena are taken into account.

The «poison of the argument» —if I may say so— lies in considerations seemingly marginal, but in fact substantially central, to the analysis of production.

Everybody agrees with the concept that production requires a plurality of cooperating parties, for example, in the workplace (including possibly in the open such as a vineyard), which implies, very often, a certain proximity of residence of the families of workers of any given firm or group of firms to the workplace. Let us ask ourselves: does proximity of the workers' houses to the factory affect job performance? In a superficial examination the factory may look as a fortress isolated from the houses of its workers, deriving its efficiency only from its methods of production. In fact, mainstream economics, at least in its didactic expressions, tends to isolate conceptually, in regard to analysis of the facts of production, the conditions of the productive process «inside the factory» from what happens outside, in the portion of the society that hosts the firm —with an implicit assumption that what happens «in the vicinity of the firm», is irrelevant, or almost, for the production process in question.

No economist denies, of course, the importance, for example, of the territorial distribution of the family settlements of the firm's workers (the analyses of commuting *docet*), but many economists believe it safe to ignore —at least to a first approximation, which is often not followed by any second approximation— its influence on the average «social» cost of production of goods and on the properties of the product.

The example of commuting is enough to tell us that a situation where people live in different localities to where they work can affect both workers in terms of convenience and entrepreneurs as a consequence of employing workers of different origin

—possibly varying in ethnicity. Well, all this can be integrated into the mainstream economic approach.

What is the *punctum dolens* (sore point) of the dominant argument? It is that a factory that has all its workers located within the walls of the town is not seen as something «essentially different» from one that also attracts workers residing at a distance. But in fact there is a difference, because we must take into account not just transportation costs or time required by commuting, but also the effect of cultural belonging to local societies who have a past more or less congruent with the type of performance required. We can ask what would have happened to Prato if instead of immigration coming from the close countryside, the development had started with migration from Southern Italy? Not to say if it had started with Afro-Asiatic migration! What would have been the implication for the development of Prato's textile industry?

For me, the logical approach is to classify working people and their families according to criteria rooted in a historical and socio-anthropological analysis of the productive nucleus and the changes it goes through. This approach clearly works for a substantially homogeneous productive nucleus such as in the processing of marble or wood in an area where the raw material is found (e.g. the manufacture of furniture made of chestnut in an area where chestnut trees grow); but the concept also has a more general validity.

## 10. The importance of places

So what? So there are places —that is, settled human groups— which have demonstrated a «productive talent», that has matured over the centuries, and this talent has moulded the territory and the *forma mentis* (mindset) of the population (the two main «fund factors» of the Roegenian analysis fund-flow: Georgescu-Roegen, 1971, pp. 211-275), and these places are able to find consumers for their products; while there are other places which are still looking for consumption needs towards the fulfilment of which their production can be advantageously orientated.

A sort of general equilibrium would exist in a situation where each place produces the things for the production of which it is better equipped (culturally and naturalistically). The equilibrium would reflect not so much an optimum allocation of «factors of private profit», but, rather, a best way to allocate factors (natural and historical) for satisfaction of human needs —including work— , considering humans as consumers and producers at the same time.

The key distinction in a market economy is between factors of human welfare and factors of profit. Only when the rates of substitution in the use of all traded goods equals the terms of trade between the goods can we say that the system, rather the «system of systems», is in general equilibrium.

Everything falls into place logically if we reverse the order of discourse. The production process does not consist, normally, of the direct and explicit application of techniques already known, but of a mixture of applications and adjustments to cir-

cumstances external to the production process itself at a given place and time in history. Around the technique in use there is like an atmosphere of innovative efforts that make up a reservoir of «minor innovations» —sometimes resulting in «major innovations»— that explain much of the increase in productivity. The minor innovations before being received into the productive practice —so to speak officially— increase the practical know-how of those on the ground. Such know-how is transmitted primarily by proximity, through direct observation and/or informal learning (yesterday «the workshop», today the apprenticeship).

It is precisely that atmosphere of non (or not-yet) codified productive knowledge that explains much of the ROE (returns on equities) and the ROI (returns on investment) that Signorini found to be particularly high for the firms in industrial districts. As long as this knowledge provides a differential advantage, industrial districts have a chance of development. What they have most to fear is, paradoxically, the involvement of technologists and «organizationists», who by codifying the atmosphere of technical knowledge that envelops their production processes nullify their advantage over large-sized firms.

In fact, knowledge components that can be formalized and those destined to remain in the form of know-how, grow at different rates, thus leading to changes in the relative importance of both of them.

If what has been said so far is correct, it follows that classification should break away from referring to sector in terms of proven and codified technology, and approach a formulation of the productive process that assigns an appropriate value to the processes of trial and error and to learning by proximity and direct observation. Of course, the significance of «informal» learning will differ for different processes: almost non-existent for the assembly line; fundamental for productions in which contributions «on the job» are relevant.

## 11. The matrix places-sectors

Some years ago I had come to conclusions similar to those of the group of researchers of the Bank of Italy (Becattini, 2001). Later, I included the topic in my collection of writings entitled *Ritorno al Territorio* (Return to the Territory, pp. 277-278) (Becattini, 2009). I sketched, in fact —in truth it was a bit adventurous— the idea of a matrix of places-sectors, where for each place is specified the presence of each production sector. And, vice versa, for each sector the places where it flourishes are indicated.

Included in my matrix were places that specialized in only one sector. In these places —to the extent that such places do exist— it is the sale of products from the one sector which provides their citizens with the purchasing power to buy from elsewhere all other commodities necessary for their existence.

Most of the sectors will, of course, be present in more than one place, just as most of the places will have the presence of more than one sector. A non-specialized place will appear in the matrix as possessing a long list of sectors, while an industry linked to certain specific characteristics of the territory (be they natural or historical) will only appear in certain places.

Such a matrix of places-sectors would show: *a)* the sectorialisation of any given productive place and/or the territorialisation of each given production apparatus; that is, in terms of the researchers of the Bank of Italy, the degree of «geo-sectoriality» of any given place or productive sector; in my terms, the degree of «productive chorality»; *b)* in the usual terms of the industrial economy, the roots and/or territorial distribution of a given productive sector. Such analysis would enable, ultimately, the design of an industrial policy that takes into account, *ab initio* and as a whole, the characteristics that are structurally favourable to the settlement of a given activity in a given place, one where this activity is not currently located. Such an objective is similar to those carrying out input-output analysis, but in our case with more general scope and more anchored to the territory. So, for example, in the case of wine production, analysis using our approach does not result in a picture of an asceptic viticulture, placed here or there, but entails recognition of places having their own special flavours, maybe using particular bottle shapes, both developed patiently over the centuries, reflecting the influence of generations of vine-lovers, along with the cultural traits of the «territory».

If you let your imagination run wild —which can be a good way of proceeding if you do not believe in it too much— can you think of a matrix of places-sectors that would allow you to describe the industrial development of a country along a thousand possible paths from any given state of development of the productive apparatus? Fantasy? Perhaps, but what is certain is that we really need a general productive phenomenological framework that captures two aspects together —physical and psychological proximity— if we want our studies to be truly at the service of man.

Hence my proposal of an alternative framing of productive phenomena to that of geo-sectoriality —releasing it from the pure and simple but mystifying concept of «productive sector»— namely «productive chorality», a concept which has its roots not in the economic history of the places but, rather, in their history *tout court.* We could perhaps say that we are talking about history of productive culture in an anthropological and/or sociological sense, perhaps even more than in a purely economic one.

In other words, we conceive of a development over time of «places of production» —that is, concretely, of all places— that witness the emergence of now one sector, then another; now the predominance of codified knowledge, now the flowing, elusive, pervasive influence of know-how.

## 12. Some final remarks

In short, the philosophically correct basis for analysing productive phenomena would be a dialectical-evolutionary vision of the totality of economic phenomena. In this perspective, instead of talking about localized sectoral specialization, or sectorialized local specialization, we should speak rather of a composite process where, in the service of human growth, act either simultaneously, or alternately, forces that come both from co-existence and co-production: external economies of «proximity of character» and external economies of «technical-productive proximity», all aimed at better satisfying a particular nucleus of needs.

This is my answer to the interesting proposal of the researchers of the Bank of Italy: —a reading of the data of production through the filter of geo-sectoriality. Such a reading— I repeat, and conclude —goes, in my view, in the right direction, but is perhaps timid and incomplete.

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*Section* ARTICLES

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# Giacomo Becattini and the Marshall's method

Joan Trullén *

**ABSTRACT**: The studies of Giacomo Becattini concerning the notion of the «Marshallian industrial district» have led a revolution in the field of economic development around the world. The paper offers an interpretation of the methodology adopted by Becattini. The roots are clearly Marshallian. Becattini proposes a return to the economy as a complex social science that operates in historical time. We adopt a Schumpeterian approach to the method in economic analysis in order to highlight the similarities between the Marshall and Becattini's approach. Finally the paper uses the distinction between logical time, real time and historical time which enable us to study the «localized» economic process in a Becattinian way.

**JEL Classification**: B31; B41.

**Keywords**: Giacomo Becattini; industrial district; Marshallian industrial district, economic methodology.

## Giacomo Becattini y el método de Marshall

**RESUMEN**: Los estudios de Giacomo Becattini relativas a la noción de «distrito industrial marshalliano» han provocado una revolución en el campo del desarrollo económico en todo el mundo. En el documento se ofrece una interpretación de la metodología adoptada por Becattini. Las raíces son claramente marshallianas. Becattini propone un retorno a la economía como una ciencia social compleja que opera en el tiempo histórico. Adoptamos un enfoque schumpeteriano al método de análisis económico con el fin de poner de relieve las similitudes entre el enfoque de Marshall el de Becattini. Por último, el trabajo utiliza la distinción entre tiempo lógico, tiempo real y tiempo histórico que nos permite estudiar el proceso económico «localizado» de una manera Becattiniana.

**Clasificación JEL**: B31; B41.

**Palabras clave**: Giacomo Becattini; distrito industrial; distrito industrial Marshalliano, metodología económica.

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## 1. Introduction and aims

Giacomo Becattini has been one of Italy's most influential social scientists worldwide during the last twenty-five years. His contributions to the history of Marshallian economic thought and to the field of local economic development are internationally acclaimed. Few Italian economists have provided such a lucid interpretation of contemporary economic processes.

His studies concerning the notion of the «Marshallian industrial district» have opened up new perspectives in the analysis of local economic development. This has led to a revolution in a wide range of research areas in territorial economics, both theoretical and applied, and to abundant literature of high quality. I can attest to the fact that the notion of the «industrial district» has gone, in just thirty years, from being a tool of very limited use among experts in the field of industrial economic thought to being a widely-used concept for economists concerned with economic development and industrial policy.

It is now three decades since the appearance of the seminal article, «Dal "settore" industriale al "distretto" industriale. Alcune considerazione sull'unità di indagine dell'economia industriale» which was published in *Rivista di Economia e Politica Industriale,* No. 1, 1979[1]. In this article, Becattini explains some of the central ideas published in his most important, previous work, *Lo sviluppo economico della Toscana* (1975), which he carried out at the IRPET (Istituto Regionale per la Programmazione Economica della Toscana). In this document on the industrial development process, Becattini formulates a discourse, that is ahead of its time by more than a decade, which provides an interpretation concerning the core of endogenous growth theories: defined as the existence of a «mechanism for the creation and transmission of economies external to the firm but internal to the industry, operating through the proliferation of small and medium-sized companies at different stages of a given production process».

Becattini proposed the term «Marshallian industrial district» for this phenomenon which can only be partially accounted for by Alfred Marshall in his *Principles of Economics*.

Just as we must distinguish between the economics of Keynes on the one hand and Keynesian economics on the other, in my view we need to distinguish between the industrial district in Marshall and the Marshallian industrial district. Becattini goes much further in his analysis of the industrial district than the one proposed by the great Cambridge economist Alfred Marshall. As Becattini notes in the last section of his seminal 1979 article: «Now I have introduced my proposal clothed in Marshall's robes»[2]. Becattini proposes changing the ways of analyzing localized economic processes (see also Becattini 2002).

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[1] English version: «From the industrial "secto" to the industrial "district": some remarks on the conceptual foundations of industrial economics» at Giacomo Becattini (2004). The English version contains some changes that affect the title and the contents respect the Italian original version.

[2] Translated from the Italian version.

However Becattini's contribution to the development of current economic analysis goes much further than proposing a field of study and accurately defining its limits in order to interpret local economic development. I think the great contribution of Professor Becattini is to propose a method of economic analysis in the tradition of Cambridge which marks the return to a way of doing economics that has been virtually outlawed in the day-to-day practice of the economist.

For Becattini, the political economy, the economic analysis in Schumpeterian terms, goes beyond theory and the contrasting of theories. He does not only propose «a return to the territory», and a new approach to the area of study concerning industrial analysis, but also a return to the economy as a complex social science that operates in historical time, capable of emphasizing «social depth» and «cultural outreach» in empirical research, and of addressing this complex reality together with other disciplines such as history, geography and sociology.

Perhaps what stands out most is Becattini's ability to understand economic discourse in the way Marshall does. This is more important than the concepts taken from the box of tools in the tradition of Marshallian economy such as the industrial district, the notion of human character, the firm as a social entity and external economies.

In the first place, I will argue that the Becattini's career as a researcher corresponds exactly to the ideal of the «complete economist» at Cambridge. The issue is not just about whether his proposal concerning the «industrial district» is original but if his scientific method corresponds to the Cantabrigiensis ideal.

What follows is a discussion of the unit of analysis needed to deal with contemporary economic development: the Marshallian industrial district. I will use a Robertsonian interpretation.

Finally, we adopt an Schumpeterian approach to the method in economic analysis in order to highlight the similarities between the Marshall and Becattini's approach. To conclude, the paper ends with a consideration of the notions of logical time, real time and historical time. These notions emerge from the approach taken by Marshall, Keynes and Schumpeter which enable us to study the «localized» economic process in a Becattinian way.

## 2. Giacomo Becattini: a complete economist. Concerning Marshall's method and Becattini

In order to understand Giacomo Becattini we need to see his work in the context of Marshall and the Cambridge school. Becattini's method links up with Marshall's method**.** It represents a search for a way of proceeding which explains the economy and which includes induction, deduction and history, and places the very tools of analysis in their historical context. In this sense, the ideal of the «complete» economist which Keynes refers to characterize Marshall is perfectly attributable to Giacomo Becattini.

Let us briefly consider Marshall's method. We will start with the authoritative text of John M. Keynes. In Keynes' obituary of Alfred Marshall, Keynes explained his ideal of what a multifaceted or complete economist should be by referring to the singular combination of qualities that he found in Marshall.

> «In another respect the diversity of his [Marshall] nature was pure advantage. The study of economics does not seem to require any specialized gifts of an unusually high order. Is it not, intellectually regarded, a very easy subject compared with the higher branches of philosophy and pure science? Yet good, or even competent, economists are the rarest of birds. An easy subject, at which very few excel! The paradox finds its explanation, perhaps, in that the master-economists must possess a rare combination of gifts. He must reach a high standard in severa1 different directions and must combine talents not often found together. He must be mathematician, historian, statesman, philosopher in some degree. He must understand symbols and speak in words. He must contemplate the particular in terms of the general, and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purposes of the future. No part of man's nature or his institutions must lie entirely outside his regard. He must be purposeful and disinterested in a simultaneous mood; as aloof and incorruptible as an artist, yet sometimes as near the earth as a politician. Much, but not all, of this ideal manysidedness Marshall possessed. But chiefly his mixed training and divided nature furnished him with the most essential and fundamental of the economist's necessary gifts —he was conspicuously historian and mathematician, a dealer in the particular and the general, the temporal and the eternal, at the same time» (Keynes, 1936/rep. 1989, vol. X, pp. 173-174).

Note that Keynes not only refers to the need for the economist to be able to use tools of economic analysis such as mathematics, history, statistics and logic at the highest levels, but also to go beyond the strictly professional, combining action with neutral disposition. If it is true that no aspect of human nature or its institutions must lie outside the brief of economist then the job is one of enormous complexity at which few excel. No wonder then that good economists (or just competent economists) are the rarest of exotic birds.

Subsequently, Keynes himself, in his address delivered at the Roya1 Statistical Society on April 21, 1936 to mark the centenary of the birth of William Stanley Jevons, more accurately summed up the skills or qualities that in his opinion characterized the complete economist, namely the different qualities that should be found in a good economist:

> «In my memoir of Alfred Marshall I called attention to the manysidedness which seems to be necessary equipment for an economist. Jevons was certainly a notable example of this. To his scientific and experimental training which led him to his inductive studies and his logical and analytical bent which led him to his deductive studies there was added an unusually strong historical, and even antiquarian, bias. From his earliest days Jevons had a native inclination to carry his inductive studies backwards in point of time, and to discover the historical origins of any theory in which he was interested» (Keynes, 1936/rep. 1989, vol. X, p. 129).

We are dealing with a systematization of the methodological approach of the economist —and by extension, the economy— which coincides almost exactly with the one that Schumpeter would develop afterwards and, as we shall see, which characterizes the view and the claims of Giacomo Becattini[3].

[3] Jevons, Keynes and Schumpeter have something else in common: at the beginning of their training as economists they developed a solid background in the philosophy of science or logic and they

The work of an economist, and in particular an economist working in applied fields and who is attempting to attain a mastery of the economic process must operate, according to Keynes, in three major areas or aspects of study: the deductive, the inductive and the historical.

But the task of the economist does not end there. The economist —both the theoretical and applied one— must know the origins of the theories being used. The history of economic analysis is a tool which allows one to understand how economic concepts evolve, the context in which various theories are developed, the interrelationships between these analytical tools and economic problems that the economist must try to solve and which are subject to changes over the course of time.

The aim of the economist must also be to understand the highly complex economic process. The motivations of the economist are generally beyond the control of a technical or detailed knowledge of a particular part of reality. When Schumpeter explains the grounds on which Marshall will be remembered in the history of economic analysis – in the words of one of his favourite expressions: «occupy a permanent seat on the big bus of economic science» —he affirms:

> «Marshall is not only a high-powered technician, a profoundly learned historian, a sure-footed framer of explanatory hypotheses, but above all a great economist. Unlike the technicians of today who, so far as the technique of theory is concerned, are as superior to him as he was to A. Smith, he understood the working of the capitalist process» (Schumpeter, 1954, p. 914)[4].

Marshall's methodological design is masterfully summed up in a letter to Edgeworth and from which we selected the following passage:

> «General reasoning (i.e. "theory") is essential, but a wide and thorough study of facts is equally essential, and the combination of the two sides of the work is alone economics prover» (Becattini 1993).

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published works of great importance in these fields. For Jevons, whom Schumpeter described as «very able and logical as an economist,» half of his scientific output is related to logic. The Treatise on Probability by John Maynard Keynes is an important contribution to the development of probability theory. The early work of Schumpeter *Das Wessen und der Hauptinhalt der theoretischen Nationaloekonomie* published at the age of twenty-five systematically explores the methodological foundations of economic theory. Not in vain was economics born as a moral science, and economists, especially the British ones, systematically explored the philosophical side.

[4] Marshall's influence (particularly on the use of mathematics as a primarily heuristic tool) also seems relevant: Harrod, like Skidelsky (e.g. 1986), have both shown that Keynes —like Marshall— was fluent in the language of mathematics. Although Marshall was not a cutting-edge mathematician he had a sound understanding of mathematics. But Marshall did not understand that the presentation of economic theory in mathematical form was the best way to simplify the language, saving words, and even finding heuristic values. On this non-explicit use of mathematics in the economy, Marshall's recommendation (creator of the diagrammatic economy) is very significant: «In my last years of work on the subject I had the growing feeling that a good mathematical theorem about economic hypotheses would probably not be a good economic theory, and so I tried to use the following rules more often: 1) Use mathematics as short hand and not as a tool to discover the truth. 2) Retain them until the completion of work. 3) Translate the work into English. 4) Produce images which are important in real life. 5) Burn the mathematics. 6) If there is no success with 4, burn 3. I often burnt 3».

Professor Giacomo Becattini (1993, p. 17) has expressed Marshall's basic methodological message as follows:

> «The right method of inquiry of Political Economy is a dialectic spiral between deduction and induction, theory and empirical research, allowing room for disciplined imagination and not resorting to blind algorithm. The Esprit de finesse must help and correct continuously the *esprit de géométrie*. Lightness of touch and sense of proportions are al1 simultaneously required to be a good economist. Only this combination of qualities allows the modern economist to nourish his theory with new facts and to illuminate his facts with new theories».

In my opinion, Giacomo Becattini's professional career responds to the view expressed in the quote above. In the first place, this is reflected in his work in the field of economic theory, *Il concetto di industria e la teoria del valore* in 1962 and his many studies on local development models and, of course, the theory of the Marshallian industrial district. His applied studies on the Italian reality in general and particularly the Tuscan one, that will change the way we understand the manufacturing process and the Italian development model, are part of this methodological design. Finally, his view is expressed in his work on the history of economic thought.

To conclude this section, I must emphasize the importance of historical method in the thinking of Giacomo Becattini and particularly Fernand Braudel's method or the Annales school. As he writes in his paper «Per una crítica dell'economia contemporanea. Alcune considerazione e una proposta»:

> «ritengo l'opera di Braudel come una delle grandi fonti ispiratrici del movimento per la ricomposizione del sapere sociale» (Becattini 1990, p. XVI).

In his introduction to the Spanish edition of *Il bruco e la farfalla* (*The caterpillar and the butterfly*)[5], Becattini cites Braudel:

> «Every historian must have a territory, a chosen city, a privileged observatory, well known, from which to try to see the destiny of the world better».

In *Il bruco e la farfalle (The caterpillar and the butterfly)* (2000) Becattini updates the fourth volume of this monumental collective work *Prato. Storia di una città*, coordinated by Fernand Braudel.

In short, Giacomo Becattini is positioning himself in the wake of Marshall's methodology and seeks and attains the know-how of the complete economist. He systematizes the concepts that will be used in his analysis, unfolding his economic thinking about deductive methods, notably his theory of the industrial district. He develops knowledge of the reality using statistical and historical databases, about the economic reality in Italy and particularly about Italian cities. He integrates deduction and induction in this analysis of the reality, including in it, a masterly study of the development process of Prato.

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[5] *La oruga y la mariposa. Un caso ejemplar de desarrollo en la Italia de los distritos industriales* (Publicaciones de la Universidad e Valladolid, 2005). The book has also an English translation: *The caterpillar and the butterfly. An exemplary case of the development in Italy of the industrial districts* (Felice Le Monnier, 2001).

But just like his admired Miguel de Cervantes in Don Quixote, he sets the action in the territory, but above and beyond the territory: «Somewhere in La Mancha in a place whose name I do not care to remember ...» and builds a universal novel from a local story. Becattini, in his study of Prato, in a similar way to Cervantes, analyzes the contemporary industrial economy through the study of a specific local context. His studies transcend the local to find the universal.

In addition, Becattini follows in the wake of the great economists of Cambridge, since not only was he concerned with the analysis of economic reality but he also actively participated in the social process, by writing for print media such as *Il Sole 24 Ore* or magazines of a social or political ilk such as *Il Ponte*.

Finally Becattini considers Marshall's work to be of supreme importance in the sense that he saw the need to maintain an on-going dialogue between the economic and the ethical. The economist must be imbued with values. And their actions must ensure economic policy proposals which aim to enhance humanity's progress.

## 3. The unit of analysis: Becattini's proposal for a Marshallian industrial district

In my opinion, the real merit of the Becattini's proposal lies in what we know as the «Marshallian industrial district». We will adopt a «Robertsonian» interpretation of his ideas, stressing the importance of the possibility of increasing manufacturing returns from territories and areas equipped with external economies and small and medium-sized firms. So I will propose an interpretation of the reasons for the international success of the theory of the Marshallian industrial district, especially in areas which are not dominated by large industrial companies as in Spain (Catalonia, Valencia) and many countries which have industrialized somewhat later like China or Russia. This kind of success transcends scientific knowledge and is expressed in the form of new development policies based on the theory of the industrial district, as in Spain's case.

The term «Marshallian industrial district» has been at the centre of an interesting theoretical and empirical debate which started in Italy in the late 1970s until the present. Thanks to Giacomo Becattini, the notion of industrial district has grown to influence areas such as international trade (Paul Krugman)[6], economic geography (Allan Scott and Michael Storper), development theory (Ash Amin and Kevin Robins) and the theory of the firm (Maria Teresa Costa)[7]. In Italy the work of the «Florence School» (Giacomo Becattini and his associates: Marco Bellandi, Gabi Dei Ottati, Fabio Sforzi) has helped to disseminate the method of analysis proposed by Becattini. Empirical studies have ensued from the work of Luigi Federico Signorini, researcher at the Bank of Italy, and Fabio Sforzi.

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[6] Paul Krugman back in 1994 devotes the bulk of chapter nine «The Economics of QWERTY» to the question of the industrial district) (pp. 221-224).

[7] An analysis of the Marshallian concept of industrial district, which takes account of major districtualist developments until 1989 is to be found in Trullén (1990).

Today the term «industrial district» is present in much of the literature on local development not only in Italy but a significant part of European countries and other parts of the world, including China, Latin America and Africa[8].

At root, there is the perception that certain Italian industrial cities located in the northeast and centre of the country responded with greater success than the big industrial cities of the north to the challenges of the economic crisis of the seventies. It is characterized by the existence of a strong network of small and medium-sized companies open to international competition and specializing in the production of consumer goods or producer goods, with irregular and unpredictable demand. Cities such as Prato, Bologna, Ferrara and Ravenna and nearby areas of influence, proved more responsive to the crisis of the seventies than the industrial cities of the Milan, Turin and Genoa triangle. To what extent was this anomaly, or was it in fact a case study that needed further investigation? Becattini's answer was very clear: the behaviour of cities such as Prato and Bologna was similar to the behaviour Marshall had observed in certain English industrial cities in the late nineteenth century: Sheffield, Nottingham, Birmingham or Manchester. They managed to compete effectively without the need for vertical integration used in production of goods by large firms. Marshall proposed defining these industrial cities as «industrial districts.»

The key theoretical characteristics of industrial districts according to Becattini are as follows: they are systems which are open to international competition, must base their production on industrial activities, and not necessarily focus on one sector, but rather on an activity which contributes to very different sectors or industries. The firms must be in competition with each other because otherwise the district would tend to concentrate the activity in one or a few large companies.

The industrial district must have an industrial atmosphere, internally generating a wide range of positive external economies. These external economies are of a very different type. They affect the transmission of information, innovation and technology. They also affect the labour market, providing specific and generic training characteristic of the dominant activity in the district. Furthermore, in the district the costs are shared by different companies which make cost analysis production of a single firm largely irrelevant: production becomes efficient because it is joint production.

These economies which are external to the company, considered on a small, individual basis and internal to the industry of the entire district are more productive than competitors based in a large company and outside the district.

Changes in technology and the internationalization of the markets since the mid-seventies and great variation in demand, have endowed the towns with substantial advantages in relation to their competitors in the style of the industrial district.

However, there are two essential characteristics regarding the industrial district that I would like to emphasize: first the existence of increasing returns; and second,

[8] See the special issue dedicated to 25th anniversary of the theory of Marshallian Industrial District, *Economía Industrial,* Madrid, 359, «El Distrito Industrial Marshalliano: un balance crítico de 25 años», 2006.

the importance of territory and history that explains the continuity of industrial production[9].

In my view, the existence of increasing returns needs to be reconciled with competitive market practices. This possibility, identified by Dennis Robertson as the «dilemma of Robbins», required the presence of dynamic external economies. Indeed, using Marshallian assumptions regarding external and internal economies, it was possible to identify, within the domestic economies or increasing returns, two alternative development paths:

1. increasing returns to scale,
2. and increasing returns based not on the scale of production, but on the standardization of certain external economies as a model[10].

Sraffa had stated that the existence of increasing manufacturing returns led inexorably to a concentration of the industry**.** In his view, while it was theoretically permissible to expand the possibility of increasing returns through the spread of external economies, this fact was in practice, in Sraffa's view, non-existent or irrelevant. Thus Sraffa's model does not even address this possibility, and says furthermore that the presence of important externalities would cancel out the competitive model.

Dennis Robertson, in opposition to Piero Sraffa, developed an alternative theory, which reconciles the existence of external economies with the existence of competitive market practices: the so-called «internal and external Robertsonian economies» (See Robertson, Sraffa and Shove, 1982).

Becattini's contribution to Fernand Braudel's study of the economy of Prato restates the question: was it possible to identify industrial systems that could respond to competition from large companies with increasing returns due to the development of external economies? They could scale up production while maintaining their competitive conditions. These were the Marshallian industrial districts.

But Becattini's contribution is not just the importance of re-applying an old concept lying in the bottom of the toolbox of economic analysis. The value of his approach lies in my opinion in his proposal to change the unit of investigation in the field of industrial economy using this concept of the importance of place and, in passing, the unit of intervention in terms of industrial policies. The difference is this: what matters is not the sector where production occurs but rather the place. To understand

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[9] The importance of increasing returns in industrial returns has been one of the most controversial part of applied economic research over the last sixty years. If increasing returns is significant, then the competitive model may be an inappropriate one to explain the how industrial markets work. Throughout the thirties, and in the pages of The Economic Journal there was an intense debate about the importance, even existence, of increasing returns, in what historians of economic analysis have been described as «the controversy of the empty boxes». If it was accepted that in a significant number of industrial sectors the shape of the dominant market was not competition but the oligopoly or monopoly, then it was necessary to rethink the whole micro-analytical system generally regarded as unrealistic and based on this competitive model. See a discussion on this issue in the field of Regional Science in the article by Sforzi and Boix in this same special issue.

[10] See Robertson, Sraffa and Shove (1982), pp. 62-93. This point has been developed by Muñiz (1993).

the scope and continuity of many industrial activities it is more useful to consider the place where the process of production takes place instead of the sector.

Becattini criticizes the notion of the productive sector for the purposes of the study of the industrial process. The Marshallian industrial district defines a radically different field of research and intervention. In his task of studying the capitalist economic process he suggests approaching the work from a perspective on the territory. In this way the economic historical process is localized.

The consequences of this approach to applied economic research are much more significant than was expected in the first instance. They open up the possibility of finding different ways of approaching industrial development based not on a vertically integrated industry in the style of François Perroux, but in small and medium-sized firms in the growth of external economies, and with openness to international competition. The theses of Michael Porter, Michael Piore and Paul Krugman which are disseminated in international university forums, such as the University of California, and non-university ones, such as the ILO (International Labour Organisation), or the G7 meetings presided over by President Clinton are derived from proposals by Becattini.

This approach provides industrial analysis with a new spatial perspective, and opens up the possibility and in some cases the need to study the industrial process from the territory by investigating hundreds of industrial processes on a one-by-one basis and studying the industrial process located in a particular place or territory, the cradle and the destiny of external economies.

## 4. From Marshall to Schumpeter: A Schumpeterian vision of the economy

In recent years, an interesting methodological discussion has taken place between economic historians and evolutionary economists about the method used by Marshall and Schumpeter, and the pervasive influence of the German Historical School (See Shionoya and Nishizawa , 2008).

Schumpeter's concern to build an economic science, in an evolutionary key with a leading role for the historical method, is analyzed by Yuichi Shionoya (2008, p. 15) for whom:

> «[Schumpeter] placed the economy in the wider context of social life and attempted to provide a comprehensive vision of the evolution of society as a whole, which was to be addressed by a universal social science, covering such areas as the economy, politics, social relations, the arts, science and morality».

Schumpeter first used this evolutionary approach in his *Theorie der Entwicklung wirtschftlichen* published in 1912, together with the key notion of innovation.

Schumpeter's concern regarding methodology extends throughout his whole life as an economist. But in my opinion, it is in his posthumous «History of Economic Analysis» published in 1954 which systematizes his views on method in economic

analysis in terms that not only bridge the gap between Schumpeterian analysis and Marshall's approach but also characterises Becattini's work.

So far no one has carried out such an enormous and fruitful study of economics[11] in the same way as Professor Joseph Alois Schumpeter has in his monumental *History of Economic Analysis* (1954). And yet, this work was developed from a methodological design that forty years ago might have seemed unusual, even unorthodox**:** the impossibility of identifying just one yardstick to allow the classification of the various sciences and branches of knowledge in a systematic way[12].

The scientific method, which has become increasingly specialized, does not operate according to a rational plan, predetermined or not, so that «science as a whole has not ever been consistent logical architecture, but instead a tropical jungle, not a building which is constructed according to plans» (Schumpeter, 1954, p. 45)[13]. The economy is no exception to this general principle, and in fact complies with it to the full. It is not a closed, well-defined science in the way acoustics is but «rather an accumulation of poorly coordinated and overlapping research fields in the sense that it is "medicine"» (Schumpeter, 1954, pp. 41-46).

According to this view, science is «any kind of knowledge that has been the subject of a conscious effort to perfect it». Through this process of perfection, certain habits of mind develop (or methods or «techniques») and a command of the facts discovered by these techniques. It is therefore possible to redefine science as «any field of knowledge that has developed special techniques for finding facts and interpretation or inference (analysis).» It therefore requires the existence of a community of researchers that are distinct from the ignorant or the inexperienced person in the domain of those facts or techniques[14].

Schumpeter's methodological position differs from the usual assumptions about analytic philosophy (Schumpeter precedes Popper chronologically speaking), aligning himself more with logical positivism (which is contemporary), but with a signif-

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[11] On Schumpeter as a person and his work see the obituary by Paul Samuelson in the AER. In Spain the dissemination of Schumpeter's ideas, was largely due to Professor Fabian Estapé, and his translators, the philosopher Manuel Sacristán (HEA), Jesús Prados Arrarte (for the translation into Spanish) and Antoni Montserrat and Jaume Casajuana (into Catalán). An excellent interpretation of the Schumpeterian system of thought is to be found in the introduction by Fabián Estapé to the work «Capitalism, Socialism and Democracy», in which, to paraphrase Schumpeter himself, he suggests that Schumpeter's collected works are one of the few major works of contemporary economic thought. Schumpeter (1942, pp. 5-28).

[12] Classification (or division) constitutes together with definitions and induction, one of the three core areas of traditional formal logic, prior to Popperian analytic logic. Concerning the relations between these concepts Professor Sacristán (1973) has written: «All three are interrelated in the methodology of science: the division (or classification) often provides elements for definition... In turn, definition requires the extension, for example, of a number of phenomena, and therefore could be the starting point of a division of these phenomena, and also a prerequisite for any general statement (obtained by induction) regarding these phenomena. Conversely, the inductions obtained refine the definitions to enrich our knowledge of the phenomena studied».

[13] The use of a biological metaphor, especially those concerning the plant kingdom is traditional in economic analysis, particularly for the Cambridge school of thought (UK): Marshall and Robertson, are key references in this respect.

[14] Here Schumpeter clearly anticipated the thesis of Thomas Kuhn (1962).

icant nod to history. We will try to explain some of its basic propositions which are different from the standard view of analytic philosophy.

Modern scientific procedure has been traditionally characterized by the identification of verifiable facts that can be observed, while admissible methods were found in the field of logical inference. Faced with this basic thesis which the Vienna Circle philosophers defended (notably Wittgenstein and Carnap) and in connection with the assertions that they made in relation to criteria for empirical verification of scientific statements or propositions of a synthetic nature [15], Popper posed the idea of a fundamental asymmetry between verification (induction) and falsification (deduction) [16]. Hence Popper characterizes science by the use of hypothetical-deductive method.

We can explain the Schumpeterian method as an approach that allows us to combine the formerly dominant positivist philosophy with the falsificationist approach still in play. It uses the hypothetical-deductive method for the presentation of theories, recognizes a role for the inductive method in applied fields and, in particular, statistical contrast and emphasizes the open nature, and therefore historical nature of economic analysis [17].

For Schumpeter, the elements that distinguish the scientific economist from the rest of the people who think, speak and write about the economy «is the mastery of techniques classified under the three general headings of history, statistics and theory. The three together constitute what we will call economic analysis» (Schumpeter, 1954, p. 47).

Let us distinguish between the Schumpeterian conception of science from the Popperian one presented in *The Logic of Scientific Discovery* (Popper, 1959). The latter will pose a fundamental methodological problem regarding the choice of method or methods of inference. The father of the analytic school, the Austrian philosopher Sir Karl L. Popper, in his research program on inductive inference [18] would suggest doing away with inductive inference, replacing the induction principle for falsifiability as the criterion for demarcation, in keeping with the theory of hypothetical-deductive method. According to this view, science is characterized by way it formulates or contrasts its propositions. The object or material that is studied does not define science.

The Schumpeterian concept of «science» is different from the Popperian conception. Science is not classified or defined by its methods or by object. Science in

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[15] For logical positivism, a proposition can be analytic or synthetic. An analytic proposition would be true through definition in its own terms. In contrast, a synthetic proposition would be true through experience. Hence, a synthetic proposition requires empirical verification (See Blaug 1990).

[16] Popper (1935, p. 33): «In this book I intend to give a more detailed analysis of contrasting deductive methods and try to show that all the problems that are often called "epistemological" can be dealt with in the framework of this analysis. In particular the problems that arise from inductive logic can be overcome without giving rise to new ones in their place».

[17] An application of the Schumpeterian method to the Spanish economy can be found in the introduction of Trullén (1993).

[18] Regarding the context in which Popper considers —with Bertrand Russell— solving (or demolishing) the problem of induction, see the introduction and postscript to The Logic of Scientific Discovery». Chapter 1 is devoted to the Problem of Induction.

general and economics in particular, is a set of skills or habits of thought, methods or techniques that scientists or researchers carry out trying to improve «the stock of existing facts and methods and during this process, master some of the skills and methods unlike the "layman" or the mere "practitioner" in relation to that knowledge» (Schumpeter, 1954, p. 42).

The existence of verifiable facts and the need to apply the rules of logical inference by starting with the existence of these verifiable facts, allows us to distinguish scientific procedure from other branches of knowledge or procedures.

Furthermore, in the case of economic science the subject is historical. The economy would be a «continuous historical process, so that the economy of different eras is largely a different sets of facts and problems» (Popper, 1959, p. 40) This philosophical conception of «science» refers, then, to a conception of economics as a historical process.

We can now sum up the main defining elements of this Schumpeterian conception of economics.

First, we must distinguish economic analysis from economic thought. There are many considerations regarding economics that are not scientific in nature and yet may be of interest to understand certain economic mechanisms. They constitute thoughts regarding the economy, but do not constitute economic analysis.

Economic analysis is composed primarily of economic history, statistics or a set of methods for measuring economic phenomena, and theory [19].

Economic history brings to the economy, a social and institutional dimension that characterizes it, in contrast to the so-called experimental sciences. For Schumpeter it is the most important of the three key economic fields. This is for three reasons. First, one cannot understand economic phenomena without a historical context: the economic facts change over time. Second, economic history facilitates understanding of relationships between economic and non- economic events, in particular to identify relevant institutions for a proper economic diagnosis. And in third place it offers historical experience to economic analysts, thus allowing them to avoid many of their perennial mistakes (See Schumpeter, 1966, pp. 330-331).

On the role of economic history according to Schumpeterian economic analysis, and illustrative of the complex relationship established by the theory, we give an example by using the very proposal of Schumpeter himself in one of his later works. It is the study of business cycles and in particular of the existence of changes in the production function and the consumption function. On the role of historical research in economic analysis, Schumpeter wrote in one of his last works:

> «What is needed is a wide collection of industrial and locational monographs all written under the same auspices and giving proper attention on the one hand to the incessant historical change regarding production and consumption, and secondly the quality and performance of senior staff».

[19] Additionally Schumpeter recognized economic sociology as a proper field within Economic analysis. Schumpeter (1954).

We can observe from this last excerpt from Schumpeter's work that he proposes not only the study of the industry but also the locations. Becattini's proposal to study the Marshallian industrial districts can be seen in the light of this Schumpeterian proposal.

Later, Schumpeter also wrote:

> «You must refer to industrial history in a way that, (once the analytical work has been carried out), provides checks, comparisons, digressions, designations, and also tells us where we can expect the oscillatory movements to play a role. The theoretical and statistical analysis is in this sense as necessary as the historical research» (Schumpeter, 1966, p. 331).

A set of procedures or data sources are a fundamental part of economic analysis, and particularly for applied economic analysis. This set of procedures may include very broad statistical domains, such as descriptive statistics, theoretical statistics, sampling theory and actuarial statistics. The collection of econometric fields, such as the method of least squares, simple regression, multiple regression, probit and logit models, simultaneous equations models, models of expectations, among others such as time series models and models based on co-integration.

No one can question the relevance of quantitative methods in current economic analysis. Schumpeter in 1933, in the first article of the first issue of Econometrics —a Journal published by the «Econometric Society»— said: «We have these beliefs and only these beliefs in common: first, that economics is a science, and second, that science has a very important quantitative (Schumpeter, 1933, pp. 5-12) element». The quantitative elements in economics have been widely developed in economic analysis based on the development of statistical sources, the progress of statistical and econometric tools, and computer systems.

The term «theory» often encompasses two distinct notions. First, the reduced set of hypotheses or general postulates of science. Secondly, the comprehensive set of «primitive notions», assumptions, axioms, and theorems which make up a science. We must always be vigilant as to which of those two concepts is being used in order to avoid confusion.

It is widely acknowledged in the debate on method in economics that the best definition of economic theory is one proposed by the Cambridge economist Joan Robinson: economic theory is a box of tools (Robinson, 1933). In the exercise of scientific research on a daily basis, theoretical or applied, this instrumental view of economic theory acquires its full meaning. A knowledge of a wide range of instrumental hypotheses, axioms, laws, and statements derived from the hypotheses and theorems is a fundamental requirement to do economic research. Learning to select one or more relevant analytical tools for each problem is probably the most subtle and complex challenge for a researcher, and especially subtle and complex in Applied Economic Research. In this sense, the first definition of theory is less crucial than the second for the purpose of studying the fundamentals of applied economics.

Hence, just as it is not possible to understand economic analysis without economic theory, nor is it possible to conduct applied economic research without identifying the relevant theoretical tools beforehand.

## 5. The economy as a process: logical time, real time and historical time. The combination of rigour and relevance

In economic analysis, and in applied economic analysis in particular, it is necessary to distinguish three radically different notions of time: the notion of logical time, the notion of real time and the notion of historical time. This distinction may allow for the identification of a relationship which is more complex than the one usually recognized between economic theory and applied economics, and which postulates the need to go far beyond the mere relationship between theory and the process of testing it. We will explore in this section some of the developments in these categories [20], with the intention of illustrating attempts to explain what Schumpeter called «a theory of economic process» that would constitute the «economic theory of the future».

This distinction may be useful in understanding the method used by Giacomo Becattini in his work and especially the theoretical and applied explanation of the «Marshallian Industrial District». It is the study of the economic process sited in specific locations, and explained in historical time.

Schumpeter's proposal is to build a theory of economic process understood as «development of inner drive, in historical time, a process that at every moment is a situation that determines the next one» (Schumpeter, 1942, p. 33).

To distinguish between the notions of logical, real and historical time we must incorporate in the analysis one of the fundamental methodological improvements of the twentieth century. It is proposed by John Maynard Keynes, built on his probability theory expounded in his early work *Treatise on Probability*, developed extensively throughout his life and incorporated in his *The General Theory of Employment, Interest and Money* in 1936.

Indeed, the role of time in economic analysis has undergone a fundamental change since the advent of the General Theory of Keynes. Although Marshall's distinction between short term and long term [21] is the first systematic attempt to raise the issue of economic dynamics in a different way from the classical economists, it is generally considered that the treatment of time in the *General Theory* is one of Keynes fundamental differences with Marshall's view.

Thus Joan Robinson, in his book *Economic Philosophy* (1962), affirms that Keynes has returned the notion of time to economic analysis. Indeed, the twenty-second chapter of the *General Theory* is dedicated to the business cycle using a dynamic notion of time that is linked to endogenous or exogenous economic processes (such as the evolution of the population).

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[20] Especially the principles of Paolo Sylos Labini (1992, pp. VI-VII). This paper is a reworking of his previous papers with the aim of integrating the papers published between 1967 and 1982. A survey of the work of Sylos Labini can be found in Trullén (1988).

[21] Marshall in his preface to the *Principles* states that the time is at the centre of the main difficulties of almost every economic problem.

The dynamic of the cycle, the dynamic of the peaks and troughs, in the upward and downward movements performs —in the Keynesian approach— in accordance with «some degree of regularity in the sequence and duration of the upward and downwards movements» (Keynes, 1933, pp. 279-280).

However, economic crises appear so suddenly and violently, and respond to fluctuations in the marginal efficiency of capital that they constitute a category which is only partly possible to predict and quantify. The economy must be understood in their dynamics, and money is «the link between present and future» (Keynes, 1933, p. 261).

In contrast with models that assume instantaneous and hypothetical variations, this model would give real time, time that allows the economic dynamic, in which peaks and troughs really occurred in the business cycle. Sylos Labini's proposal is denominate the abstract time of prekeynesian theoretical models as «logical». By contrast the time of economic dynamics of Keynes would termed «real» (Sylos Labini, 1992, pp. VI-VII).

The development of Keynes's ideas required fixing time as a category, in order to manage the variables for the models properly. This led first to development of models based on comparative statistics, and subsequently the development of dynamic models to reach a high level of refinement in the chaotic dynamics (Baumol and Quandt, 1985).

However, for the economist Sylos Labini —a disciple of Schumpeter— there would be a third category of a different kind of time to «real» time: this is historical time. This category responds to the use of time in the theory of economic process as proposed by Schumpeter. It is a method of explaining the economy similar to the way classical economists do or similar to path dependence, which allows the gap between economic theory and history to be bridged.

This notion of «historical» time comes close to the concept of time that Dennis Robertson uses in his theoretical and applied work, which has been termed «the Robertsonian dynamic» (See Trullén 1985 and 1993) or «dynamic period» and has attracted the attention of both Keynesian (Leijonhufvud, 1966) and monetarist economists (Wilson, 1980).

The Robertsonian method ignores the use of mathematical explanation, and alternates between the hypothetical-deductive and inductive method, as his master Keynes does, with less concern for perfection and the formalization of the models than for their explanatory power[22]. Robertson's work goes through sequential chains, according to a period analysis or Robertsonian analysis as Leijonhufvud names it. Robertson methods remove him from historicism and mathematical formulation.

Becattini's work must be placed in my opinion in the same category as the methodological developments of the Cantabrigiensis school from Keynes to Robertson

[22] On Robertson's work see the work of John Presley (1978, 1984). Some of the very few works by Robertson have been translated by the Research Department of the Bank of Spain, and probably influenced the way the Bank of Spain presents the economy.

and Joan Robinson. They are inspired by Marshall's method initially, but go far beyond it. Becattini's work incorporates historical time in a precise manner, analyzing economic processes located in space and time.

The Italian economist Paolo Sylos Labini in his work *Elementi di dinámica economica* emphasized the fact that the distinction between logical time, real time and historical time can also be of great interest to display a mode of research in economics which combines relevance and rigor. It tries to give explanations concerning relevant economic processes in an analysis which integrates rigorous methods, including, as Schumpeter did, theory, quantification and history. In this work, Becattini, with his studies on the Marshallian Industrial District, brought to contemporary economic analysis, a way of doing economics using Marshallian methodology, which includes a theory about and a knowledge of reality, and a study of economic processes in historical time. Thus, he builds a significant part of the «economic theory of the future» proposed by Schumpeter.

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*Section* ARTICLES

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# What about Industrial District(s) in Regional Science?

Fabio Sforzi *, Rafael Boix **

**ABSTRACT:** The aim of this paper is to critically consider how the concept of «industrial district» was born and evolved in the field of regional science. Despite the claim by Isard that the emergence of a spatial dimension in economics was being hampered by Marshall's alleged prioritising of time over space (Isard, 1956), the concept of «localization economies» introduced into regional science by Ohlin, Hoover and Isard clearly is itself a legacy from Marshall. This contradiction in the work of Isard and others followed to a large extent from the way in which Marshallian concepts were historically situated in economic thought before Giacomo Becattini's re-reading of Marshall and his ideas. This re-reading began in the 1960s, focussing on conceptual issues related to industry (Becattini, 1962), and then culminated in the following decades with work on the idea of the «industrial district»: considering it first as a unit of investigation of economic research (Becattini, 1979) and, later, as a way of industrial development (Becattini, 1989). In brief, the originality of Marshall's economic thought can be found in Book IV of his *Principles of Economics*. This originality can be seen in the statement that economics is more important as a way of studying man in society than as a way of studying wealth; and continues through the affirmation that man's character is moulded by his daily work. That is to say, a person's «place of living» (where individuals live and work) is important not only for the formation of human skills but also for the formation of character. The place as the unit of investigation (i.e. the «functional region») is one of the main elements which distinguishes the identity of regional science from other branches of economics.

**JEL Classification**: B2; R10.

**Keywords:** industrial district; regional science; regional studies; regional economics

## ¿Qué pasa con el Distrito Industrial en la Ciencia Regional?

**RESUMEN:** El objetivo de este artículo es enmarcar críticamente el nacimiento y evolución del concepto de Distrito Industrial en el campo de la Ciencia Regional. Es conocido el cargo de Walter Isard contra Alfred Marshall, según el cual este

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último, al haber afirmado la prioridad del tiempo sobre el espacio, habría impedido el surgimiento de una dimensión espacial en la economía (Isard, 1965). Sin embargo, conceptos como los de economías de localización, también introducidos en la Ciencia Regional por Ohlin, Hoover e Isard, son, evidentemente —aunque no se especifique—, un legado marshalliano. Esta contradicción se sustenta en gran medida en la forma en que el sistema marshalliano es situado en la historia del pensamiento económico antes de la relectura de Marshall por Giacomo Becattini. Esta relectura comenzó en los años sesenta del siglo pasado con respecto a la manera de conceptualizar la industria (Becattini, 1962) y culminó en las décadas siguientes con la conceptualización dual del Distrito Industrial: primero, como unidad de análisis de la investigación económica (Becattini, 1979) y después, como una forma de industrialización (Becattini, 1989). En pocas palabras, la originalidad del pensamiento económico de Marshall se debe buscar en el libro IV de sus *Principios de Economía*. Esta originalidad procede de la afirmación que la economía es más importante como una parte del estudio del hombre en sociedad que como estudio de la riqueza; y continúa mediante la afirmación que el carácter del hombre es moldeado por su trabajo diario. Esto significa reconocer que el «lugar de vida» (donde las personas viven y trabajan) es importante en la formación del carácter, así como en la formación de capacidades humanas. Pero el lugar, como unidad de investigación (es decir, la «región funcional»), es uno de los principales elementos que definen la identidad de Ciencia Regional en comparación con otras ramas de la economía.

**Clasificación JEL**: B2; R10.

**Palabras clave:** distrito industrial; ciencia regional; estudios regionales; economía regional.

## 1. Introduction: The thesis

According to the classical definition of Giacomo Becattini (1990), an industrial district is: «a socioterritorial 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». Then Becattini clarified in Duch (2006) the industrial district can also be defined as «the result of a transformation of a local community that specializes in a certain kind of production». This specialization occurs within a place defined by the residence of the local community, and encompasses a main industry and the range of goods it produces together with subsidiary industries (including manufacturing and business services) which support the economic activities of the main industry's firms. Each firm in the main industry specialises in one or a few phases of the production process.

So, the local community —composed of a community of people and a population of firms embedded together— specialises in the production of a certain range of goods and this production is organised in a form that involves «various trades relatively one another» (Marshall, 1961, p. 139). This local community shares a system of values and common practices which are spread throughout the district by means of

social norms and institutional structures (markets, firms, professional schools, trade unions, employer's organisations, and more).

Our wish to embed the industrial district phenomenon in regional science raises the question of what should be the appropriate unit for studying economic facts through a proper «regional» perspective. In our opinion this unit should be the «economic region» (hereinafter referred as the «region»), used here as equivalent to the notion of «economic nation» in Marshall (Becattini, 2002). The identification of the «region» as the key unit of investigation is that which should distinguish regional science from other sub-disciplines of economics (such as industrial economics or business economics: the first being centred on «industry», the second on the «firm»).

But, as we know, Walter Isard founded the new discipline of regional science on the basis of «location theory»: that is, places were defined in terms of the location of the economic activities of individual firms and/or aggregates of firms (i.e. industries) (Isard, 1956, 2003). It follows that the region is conceived as resulting from processes of location. In other words, in this perspective, an «agglomeration of firms» (or cluster) defines a given place, and so the place has a «derivative status»: i.e., it is a secondary concept. But the industrial district is a place-based concept, in the sense that the place (or local community) is a condition for its definition both in theory and in practice. So from the industrial district perspective the place is not a derivative; it is a «primary concept».

How to disentangle the matter? For many scholars the matter does not arise. For them an industrial district is believed to be an agglomeration (of small and medium-sized enterprises) resulting from a process of location. Obviously, we disagree with this belief. To disentangle the matter we must begin by removing the «foundation stone» on which Walter Isard founded regional science as a discipline.

This article is divided into six sections. After the Introduction, section 2 introduces what we refer to as «the American bias», based on a «location-theory filtered» interpretation of regional science and considers how Marshall's view of space was misinterpreted, leading to the omission of industrial districts from the regional science perspective. Then section 3 briefly asks: given the findings of section 2, how can the concept of industrial district fit into the regional science theoretical framework? This then leads on to section 4 which looks at how a re-reading of Marshall led to the creation of the idea of industrial district, and a proper understanding of the role Marshall saw space playing in regional development. Then section 5 sums up the essence of the industrial district idea and how it differs from other location-related concepts. Section 6 presents the conclusions.

## 2. The American bias

Isard opens Chapter 2 of his 1956 (p. 24) book *Location and Space-Economy* with a harsh critique of Marshall who was judged to have thought time was «more fundamental» than space for economic development. He cites Marshall thus:

> «The difficulties of the problem depend chiefly on variations in the area of space, and the period of time over which the market in question extends; the influence of time being more fundamental than that of space» [1].

Isard blames Marshall, and, incidentally, the Anglo-Saxon economic tradition, for preventing the insertion of space into economics (Isard, 1956, pp. 24-25):

> «Thus spoke Marshall, in line with the Anglo-Saxon tradition, and in the half-century to follow Anglo-Saxon economists were to hearken to his cry. Theoreticians of today are chiefly preoccupied with introducing the time element in full into their analyses, and the literature abounds with models of a dynamic nature. Yet who can deny the spatial aspect of economic development: that all economic processes exist in space, as well as over time? Realistically, both time and space must be vital considerations in any theory of economy. Unfortunately, however, aside from those of the monopolistic competition school of thought, particularly Chamberlin, the architect of our finest theoretical structures have intensified the prejudice exhibited by Marshall».

Isard's words «prejudice exhibited by Marshall» spread the belief (see, for example: Harvey, 1984, p. 8) that Marshall prioritized time over space:

> «The insertion of space, place, locale and milieu into any social theory has a numbing effect upon that theory's central propositions [...] Marx, Marshall, Weber and Durkheim prioritize time over space. And, where they treat the latter at all, tend to view it unproblematically as the site or context for historical action».

This misunderstanding was perpetuated until recently (see, for example: Capello, 2010, p. 34):

> «There are several reasons for this belated consideration of space by economists. Firstly, as often pointed out by the founder himself of regional economics, Walter Isard, the neoclassical school has conceived the temporal analysis of economic development as crucial and has always neglected the variable "space" as a consequence —often in order to simplify the treatment. As Marshall wrote: "The difficulties of the problem depend chiefly on variations in the area of space, and the period of time over which the market in question extends; the influence of time being more fundamental than that of space" (Marshall, 1920, vol. 5, Chapter 15, section 1). Secondly, the treatment of the variable "space" in economic analysis —especially if it is included in a dynamic approach— complicates the logical framework».

This misinterpretation of Marshall's thought comes from having chosen the «wrong» Book of *Principles of Economics* in which to look for an answer to the question of how to insert space or place in economics. Indeed, Isard chose a quote from Book V of the *Principles of Economics,* titled: *General Relations of Demand, Supply and Value.*

However, he forgot, or did not know, about Marshall's writings in Book IV, dedicated to *The Agents of Production*, where he first introduced the role of territory in the form of «neighbourhood» and «the whole civilized world» (Marshall, 1961, pp. 265-266):

> «Many of those economies in the use of specialized skill and machinery which are commonly regarded as within the reach of very large establishments, do not depend on the size of individual factories. Some depend on the aggregate volume of production of the kind in the

[1] Alfred Marshall, *Principles of Economics* (8th ed., London, 1936), Bk. V, chap. XV, sec. 1.

> neighbourhood; while others again, especially those connected with the growth of knowledge and the progress of the arts, depend chiefly on the aggregate volume of production in the whole civilized world. And here we may introduce two technical terms».

Further, this sentence precedes the introduction of one of the most central concepts in regional studies, namely that of «external economies», which provides an important link between the concept of industrial district and the field of regional science (Marshall, 1961, p. 266):

> «We may divide the economies arising from an increase in the scale of production of any kind of goods, into two classes —firstly, those dependent on the general development of the industry; and, secondly, those dependent on the resources of the individual houses of business engaged in it, on their organization and the efficiency of their management. We may call the former *external economies*, and the latter *internal economies*. In the present chapter we have been chiefly discussing internal economies; but we now proceed to examine those very important external economies which can often be secured by the concentration of many small businesses of a similar character in particular localities: or, as is commonly said, by the localization of industry».

Or maybe Isard did know about Marshall's writings in Book IV, but he was simply using what was then a typical view of Marshall's thought to highlight his own contrary ideas? Perhaps Isard decided to make an instrumental use of Marshall's statement found in the earlier influential textbook in order to create «the villain of the story» in order to support the originality of his (Isard's) own suggestion of a need to focus on a space-economy.

But actually Isard was not the only economist who misinterpreted Marshall's thought or conveniently interpreted his words. In fact, we can think of Isard as a member of a group which included two other equally illustrious authors Bertil Ohlin and Edgar M. Hoover. Let us consider Ohlin's book *Interregional and International Trade*, in which on the first page of the Introduction (Ohlin, 1933, p. 3) Marshall is cited:

> «The time element is probably the chief cause of the obstacles in the way of a clear cut presentation of fundamental economic principles. "The difficulties of the problem depend chiefly upon variations of ... ; the influence of time being more fundamental than that of space"[2]».

And then following that statement we find, apparently, the origin of Isard's argument:

> «No doubt every author of a treatise on general economics has agreed specially with the last part of the statement, for while the time element has in most cases been more or less fully considered throughout the analysis, the space element has been at first almost completely neglected —only touched upon in the theory of rent— and has later on been dealt with only from a special point of view in the theory of international trade (Ohlin, 1933, pp. 3-4)».

Probably the reason for Ohlin and Isard confronting the most recent general treatise of economics (Marshall's *Principles*) and its author, was that they were dissatisfied with the treatment that dominant economic theory of the time gave to the spatial dimension. As Isard explained (Isard, 1956, p. viii):

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[2] Marshall, *Principles of Economics*, Bk. V, ch. XV, § I.

> «... to improve the spatial and regional frameworks of the social science disciplines, particularly of economics, through the development of a more adequate general theory of location and space economy».

In order to try to develop this dimension in both trade theory and general economic theory, Ohlin and Isard resorted to the only economic tradition in which spatial interpretation had any strength: German location theory, including the books of von Thünen, Launhardt, Predöhl, Weigmann, Engländer, and in particular the treatise on location theory of Alfred Weber.

Weber's interest, however, was in a less theoretical and much more concrete question. This was expressed by his translator to the English edition, Carl Joachim Friedrich, thus: «What causes a given industry to move from one location to another?» (Weber, 1929, p. xxiv). Answering this question resulted in a theory of distribution of activities. Following in Weber's footsteps, in the United States E. M. Hoover developed his theory of localization (Hoover, 1937). But Hoover differed from Weber by using an approach which was more integrated into Anglo-Saxon economic theory [3].

An interesting feature here is that Ohlin, Hoover and Isard, interpreted Marshallian external economies through the lens of Weber's agglomeration laws, basically independent from the Marshallian point of view. This will be more widespread interpretation in the regional science. In fact, Hoover's popular taxonomy of economies of concentration (1937, p. 90) was influenced both by the works of Ohlin (1933) and by criticism of Weber's theory of agglomeration.

The second of Hoover's economies of concentration is named «localization economies», and refers to:

> «all the firms in a single industry at a single location, consequent upon the enlargement of the total output of that industry at that location».

But are these «localization economies» not an interpretation of what Marshall meant by «external economies», but without citing their origins in the *Principles of Economics*? (See the previously quoted passage from the *Principles of Economics*, p. 266). It should be said that the terms and description used by Marshall in his characterization of external economies were ambiguous enough, in the absence of a thorough study of Book IV, to allow this interpretation. Thus, Ohlin (1933) and Hoover's (1937, 1948, 1971) interpretation of the meaning of «external economies» related them to «industry» rather than to «place» [4]. So, when Isard (1956, p. 172) provided

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[3] In fact, a first attempt to compare Weber's theory of location with the Anglo-Saxon literature can be found in the Introduction by Carl J. Friedrich as editor (and translator) of Weber to English. Friedrich's introduction is meritorious in that it compares and contrasts the differences and points of view between theories.

[4] Ohlin and Hoover's interpretation followed from the perspective they adopted, that of the «theory of location» of Alfred Weber (1909). Weber's theory concerns the firm and industry, but not place. Let us say it in the words of Isard (1956, p. 172): «In his classic work on location theory, Alfred Weber emphasizes three basic location forces. Two of these, transport cost differentials and labor cost differentials, interplay to determine the regional distribution of industries. [...] The third general location factor,

an illustration of the agglomeration factors «neatly» classified by Hoover, he detailed them as follows:

> «(a) *Large-scale economies* within a firm, consequent upon the enlargement of the firm's scale of production at one point;
> (b) *Localization economies* for all firms in a single industry at a single location, consequent upon the enlargement of the total output of that industry at that location;
> (c) *Urbanization economies* for all firms in all industries at a single location, consequent upon the enlargement of the total economic size (population, income, output, or wealth) of that location, for all industries taken together».

It may be noted that Weber's term «agglomeration», the title of chapter V in his book, ended up becoming one of the most important and popular terms used in regional science. The term «agglomeration economies» was created by assimilating Marshall's «external economies» into the idea of «localization economies». A careful reading in Hoover's 1937 book of one of the case studies he presented, one relating to shoe production, reveals his knowledge of Marshall and the role played by the place. He says:

> «For only by intensive concentration of production in special areas it is possible to develop and utilize effectively the specialized labor market that is necessary. When plants are clustered in a shoe district, and especially in a single shoe city, a manufacturer knows he can secure on short notice a skilled employee for any position in his plant» (Hoover, 1937, p. 210).
>
> «Some of the more intangible labor advantages of industrial concentration have been described by Alfred Marshall in these terms: "When an industry has thus chosen a locality for itself ..."» (Hoover, 1937, p. 211, referring to Marshall's *Principles of Economics*).

Yet, in his later 1971 book *An Introduction to Regional Economics* (Hoover, 1971, p. 77-79) Hoover emphasises not the Marshallian interpretation offered in chapter XIII (Labor) of his 1937 book but, rather, in this later book, in chapter VI, a different opinion:

> «We can thus distinguish three levels at which economies of size appear. There are, in respect to any particular activity: (1) economies associated with the size of the individual *location unit* (plant, store, or the like); (2) economies associated with the size of the *individual firm*; and (3) economies associated with the size of the agglomeration of an activity at a *location*. We can refer to these economies, for brevity's sake, as "unit", "firm" and "cluster" economies [...]».

Then, in a footnote inserted at the end of the above sentence, Hoover states the following (Hoover, 1971, Ch. 4, footnote 9, p. 79):

> «What are identified here as "cluster" economies are sometimes referred to as economies of localization. Alfred Marshall's succinct characterization of the "economies of localized industries" is often quoted from his *Principles of Economics,* 8th ed. (London: Macmillan, 1925). Book IV, Chapter 10. F. S. Hall's Census monograph, "The Localization of Industries" (U.S. Census of 1900, *Manufactures,* Part 1, pp. cxc-ccxiv), reported on the development of highly clustered patterns of individual manufacturing industries toward the end

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agglomeration (deglomeration) economies and diseconomies, acts, according to Weber, to concentrate or disperse industries within any given region».

> of the nineteenth century. Unfortunately, however, the term «localization» has also been used synonymously with «location» and even in the sense of "dispersion", so it is best avoided».

This is «the American bias»: (1) the prejudice against Marshall's views on space, and (2) the location-theory filtered interpretation of Marshallian external economies. This was done in defence of regional science[5] by enthusiastic researchers.

## 3. The question

Walter Isard is the founder of regional science as a discipline or field of study. Edgar M. Hoover is a co-founder of regional economics, but his reputation in the field of regional science is so high that his book opens the list of «Path-breaking books in regional science» (Waldorf, 2003). The ideas of Isard and Hoover were so influential as to guide regional scientists and regional economists in a direction which unwittingly prevented the discovery of (1) the «industrial district» in the field of theory and (2) the «industrial districts» in social reality.

So, «what about industrial district(s) in regional science?». In the theoretical framework of regional science there is currently no place for the industrial district concept.

## 4. Back to Marshall

Regional scientists and others are aware that Alfred Marshall contributed ideas important to the conceptualization of the industrial district. Therefore we must «go back to Marshall». And Giacomo Becattini will be our mentor.

The reason for going back to Marshall is not to look up «the definition of district» in his writings: simply because there is not one! Rather, it is to prove that there is «another Marshall», one whose writings suggested to Becattini «the idea of the district». Becattini (1962) decided to address Marshall's theoretical system not according to the traditional approach, i.e. in respect of formal logical considerations, but, rather, in terms of its ideological foundations. His belief was that only through this way could the most original aspects of Marshall's thought be grasped. And history has proved he was right. It was through this *unconventional approach* to Marshall's thought that Becattini extracted a whole range of ideas that he reorganized in an original manner, and from which he derived the industrial district concept. If you look for the industrial district definition in Marshall's writings, you will not find it. The «inventor» of the industrial district concept is Giacomo Becattini.

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[5] In economics the misuse of terms such as «agglomeration economies» or «externalities» as synonyms for «external economies» is frequent. These three terms correspond to three different ways of conceptualizing localized industries. Agglomerations and externalities are concepts introduced to explain the origins of localized industries, while external economies explain why an industry, after it was formed in a place, tends to remain there for long.

The cornerstones of Becattini's contribution are: (1) the centrality of human labour; (2) a particular conception of industry; and (3) the Marshallian concept of «economic nation». In Marshall's writings there are two main references for the ideas that constitute the foundation of the industrial district concept:

— Book IV of the *Principles of Economics,* and the concepts contained therein;
— *Industry and Trade,* with its introduction of the concept of «economic nation».

The concepts brought together in Book IV of the *Principles of Economics* are well known. These include the ideas of: organization as an agent of production, knowledge as the «engine» of production, the role of local external economies, and «homines novi» as agents of reproduction of entrepreneurship.

The concept of «economic nation» is, however, little known. Few people know — or remember — that it played an important role in Becattini's conceptualization of industrial district, and was maybe even more important than the concepts contained in Book IV of the *Principles of Economics* (Becattini, 2002). In *Industry and Trade,* Marshall (1932, pp. 13-14) introduced the concept of «economic nation» as follows:

> «If the local spirit of any place ran high: if those born in it would much rather stay there than migrate to another place: if most of the capital employed in the industries of the place were accumulated from those industries, and nearly all the income enjoyed in it derived from its own resources: —if all these conditions were satisfied, then the people of such a place would be *a nation within a nation*» [emphasis added].

What attracted Becattini's interest in this concept was the «sense of belonging» that holds together these places. In this sense of belonging the «objective component» of a common interest and the «subjective components» of a historical-cultural nature are blended together. The sense of belonging is one of the founding criteria for re-conceptualizing industry (Becattini, 1962). It makes possible the conception of industry through the awareness of economic agents (workers and entrepreneurs) of belonging to a particular industry. The awareness forms inside the place where a set of productions have the common characteristic of occurring under the same technical conditions, that is characterized by the same production process.

This sense of belonging embeds the technology in the place where the production occurs since neither the production technique from the culture and social relationships that go with nor the relations of competition or alliance towards the counterpart from feelings of rivalry and solidarity that arise (e.g. between workers and entrepreneurs) can be strictly separated.

The above definition alludes to the industrial district as a «socio-economic concept», and to the fact that, as Becattini says, the district is a «social machine» that produces goods as well as people; because it moulds a distinguishing entrepreneurial and working mentality (Becattini, 1999).

We can see the difference between the above and the concept of «economic region» as found in the early works of regional science, for example when Ohlin (1933, p. 232) explains «the importance of the region concept»:

> «Districts united in the same monetary system have specially intimate relations in some ways and it is often convenient to treat them as a region. From other points of view other modes of regional division are desirable. In general we may say that there are certain groups of districts between which factors or goods or both move less easily than between the districts themselves, and that such groups should in many cases be regarded as economic regions».

## 5. The Concept of Industrial District(s)

To sum up, the industrial district is a triadic concept:

— it is a «unit of economic classification» for defining industry (Becattini, 1979);
— it is a «unit of investigation» for interpreting economic change (Becattini, 1987);
— it is a «socio-economic concept» for understanding the organisation of production (Becattini, 1989).

As a way of defining different industrial forms, the employment of the industrial district concept is superior to the use of traditional technological criteria. Such technological criteria are «place-blind», because they neglect the importance of the places where production actually occurs. As a way of interpreting economic change, the industrial district concept postulates that economic change forms concretely within and between places, and so is a socio-economic place-based process. Thus an industrial district can be seen as a form of «local development». There are other forms. For example, while the «industrial district» phenomenon exists when a community of people interpenetrates a population of firms and furthers change, in contrast an «industrial pole» refers to a community of people which is subjugated to a large company, and it is the company which furthers the change.

The industrial district as a socio-economic concept facilitates an understanding of production organisation. It explains how a local community dominated by small entrepreneurs, specialized in producing parts or in manufacturing phases of the same product, achieves economies of production through co-operation («bundles of relationships» in which they are embedded). The cooperation is made possible by a common system of values and beliefs —such as a belief in the «ethic of work and activity, of the family, of reciprocity and exchange» (Becattini, 1989, p. 113)— shared by the local population, which generates mutual trust while giving importance to the value of reputation in life and in business, and which facilitates the exchange of productive knowledge.

This kind of industrial organization can be as competitive as a large vertically integrated firm when it comes to satisfying the desires by groups of consumers in the world for variety and distinction —that is, when the demand for certain classes of goods differs from place to place and/or over time— and for which the production process can be technically partitioned. Such goods can be produced in a place where the «community of people» and a «population of firms» intertwine, and where the first furthers the change of the second, as has been found, in brief, to be the case in

industrial districts identified in Italy, Spain, and the United Kingdom (Sforzi, 2009; Boix, 2009; De Propris, 2009).

The industrial district as a productive concept is in short an output of Becattini's theoretical thinking which integrated two key ideas derived from Marshallian concepts:

— the idea of the importance of the role of a «community of people», developed from Marshall's concept of «economic nation» (*Industry and Trade*);
— the idea of the part played by a «population of firms», a concept built on Marshall's idea of place-based «external economies» (*Principles of Economics*).

Such concepts can be said to be Marshallian «tools for thinking» which Becattini would not have been able to elaborate without his study of development in Tuscany (Becattini, 1969, 1975) and in particular the history of Prato (1979-1997) (Becattini, 1997). In Becattini's view —as in that of Alfred Marshall— the «observation of facts» and «theoretical thinking» complement each other, because: (1) facts by themselves are silent; but (2) theory alone is a mere criticism.

The aforementioned three concepts of industrial district (see page 70) are not mutually exclusive; rather they are synergistic. Through these industrial district concepts Becattini is able to concretise Marshall's statement that economics is more important as a part of the study of man in society than as a study of wealth (Marshall, 1961, p. 1).

## 6. Conclusions

The title of our paper is a play on Torsten Hägerstrand's presidential address to the 9th ERSA Congress (Copenhagen 1969), later published in the *Papers of the Association* (currently *Papers in Regional Science*) under the title: «What about people in Regional Science?» (Hägerstrand, 1970). In that paper Hägerstrand distanced himself from regional science as a discipline about locations. He stated that «Regional Science defines itself as a social science, thus its assumptions about people are also of scientific relevance» (Hägerstrand, 1970, p. 7).

At the beginning of his address, Hägerstrand (1970, p. 7) pointed out «a difference in emphasis or tone between the European and North American meetings» of people involved in regional science:

> «When looking over the proceedings of the sixties one gets the impression that participants in this part of the world have preferred to remain closer to issues of application rather than to issues of pure theory. We in Europe seem to have been looking at Regional Science primarily as one of the possible instruments with which to guide policy and planning. I have chosen to proceed along this line by suggesting that regional scientists take a closer look at a problem which is coming more and more to the forefront in discussions among planners, politicians, and street demonstrators, namely, the fate of the individual human being in an increasingly complicated environment or, if one prefers, questions as to the quality of life. The problem is a practical one and, therefore, for the builder of theoretical models, a "hard nut to crack".

> Now, first of all, does the problem fall within the scope of Regional Science? I think it does. A forest economist remarked some time ago that, "forestry is people, not trees". How much more accurate it would be to say that Regional Science is about people and not just about locations. And this ought to be so, not only for reasons of application. Regional Science defines itself as a social science, thus its assumptions about people are also of scientific relevance».

So according to Hägerstrand, regional science is about people, not just about industrial location. So there is a clear difference between the conceptual frameworks employed by Hägerstrand and Isard. The American economist supported a spatial reorientation of economics through a general theory relating to industrial location (Isard, 1956), while the Swedish geographer argues for reversing this setting, by placing the local community, of which industry is an attribute, at the centre.

The similarity between Hägerstrand's conception of regional science and Marshall's and Becattini's conception of economics is remarkable (even if grounded in different philosophical backgrounds). Marshall and Becattini considered economics more important as a study of man —not in the abstract, but in relation to a given place and time— than as a study of wealth. The similarity is even more compelling when one considers that in the Marshallian universe, in Hägerstrand's time geography, and in Becattini's industrial district, at the centre of the thinking are labour and place and social organization; place and social organization being determined by labour. Social, and therefore economic change, mostly occurs in places, through the formation and enhancement of human abilities.

Despite being rooted in a different philosophical background and choosing an alternative scientific research road, Isard's last thinking on the scope and nature of regional science was not so different from that of Hägerstrand and Becattini (Isard, 2003, p. 188):

> «Regional science is primarily (a) social science. It is concerned with the study of man and spatial forms which his continuous interaction with, and adaptation to, the physical environment take».

The authors of the present paper agree. Industrial district(s) and regional science are about people and place (the local community), not about firms or individuals.

At this point, the reader will probably be wondering how the industrial district was introduced into regional thinking and into the regional science literature. This, however, is another story.

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*Section* ARTICLES

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# Three Generations of Industrial districts

Marco Bellandi *, Lisa De Propris **

**ABSTRACT:** The paper presents a theoretical framework for understanding the evolution of industrial districts from Marshall's conceptualisation to today's realities and theorisations of the industrial district as model of industrial organization and development. We discuss three generation of industrial districts: the first generations of districts were the seedbeds for the first industrial revolution. The second generations corresponded to the re-emergence of industrial districts in advanced and industrialised countries during the second half of the twentieth century, after the golden age of mass production. The current and third generation is being revealed resorting to scholarly observation. We will argue that each generation of industrial districts have emerged and grown in correspondence with specific technological, institutional and market conditions. Some evidence from the Italian case is presented.

**JEL Classification:** L60; 014; R30; R58.

**Keywords:** industrial district; manufacturing; local economic development.

## Tres generaciones de distritos industriales

**RESUMEN:** El artículo presenta un marco teórico para entender la evolución de los distritos industriales desde la conceptualización de Marshall hasta las actuales realidades y teorizaciones del distrito industrial como modelo de organización industrial y desarrollo. Discutimos tres generaciones de distritos industriales: la primera generación de distritos fueron las semillas para la primera revolución industrial. La segunda generación correspondió a la reemergencia de los distritos industriales en países avanzados e industrializados durante la segunda mitad del siglo XX, después de la edad de oro de la producción en masa. La tercera y actual generación no es una cuestión de evidencia histórica, sino que está siendo revelada recurriendo a la observación científica. Sostendremos que cada generación de distritos industriales ha emergido y crecido en correspondencia con específicas

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condiciones tecnológicas, institucionales y de mercado. Se presenta evidencia sobre el caso italiano.

**Clasificación JEL:** L60; 014; R30; R58.

**Palabras clave:** distrito industrial; manufactura; desarrollo económico local.

## 1. The three generations of Industrial Districts

The concept of industrial district (ID) re-emerged in Italy at the end of the 1970s with the success of many *Made In Italy* products related to the growth of agglomerations of small firms. Empirical inquiries complemented by the search for appropriate frames of interpretation took some social scientists first to raise doubts about and then reject a simplistic interpretation that downplayed the vitality of small firms agglomerations either as satellites emerging from the production decentralisation strategies of big manufacturing firms in peripheral regions or as the persistence of pre-modern industries in backward regions. The 1979 paper by Giacomo Becattini [1], where a re-discovery of Alfred Marshall's analysis of industrial districts and external economies was presented, may be considered the official start date of the scholarly debate on the ID as a concept that refers to a form of industrial organisation by which increasing returns are realised thanks to a local division of labour among small and medium sized firms embedded in a delimited territory. Empirically, IDs appeared as places characterised by the presence of localised industries. These studies soon intersected and started to be picked up by an emerging international scholarly community working on the boundaries of new industrial organisations and new economic geographers. These aspects are quite well known in the Italian and international literature [2]. In what follows we shall illustrate and reflect on the evolution of IDs and what forms they have assumed and are assuming as they change and adapt to technology and markets, but crucially persist as local engines of *industrial growth*. For this purpose, adopted here is an expository frame which itself is the result of recent advances and helps distinguish three generations of IDs representative of three waves of industrialization in which they have played an important and distinctive role [3].

During the first wave, IDs were the seed-beds and first-comers of the industrial revolution. The second wave refers to the re-emergence of the role of IDs within

[1] See Becattini (2004) for a collection of his essays on the ID, among which the English version of the 1979 paper (*From the industrial sector to the industrial district...*) which is the first explicit recovery of the Marshallian theme, bridging value theory and industrial organization. The paper has been re-published various times in various languages. The first English publication dates back to 1989.

[2] For a collection of studies on these concepts and debates see section 2 of Becattini *et al.* (2009) on «From the English Roots to the Italian Revival» (Introduction by T. Raffaelli).

[3] The frame of three waves could be seen as a variation on «the second industrial divide» or on «new competition» themes (see note 6). It has been introduced explicitly by Bellandi (2007). In what follows we will take advantage extensively from the contributions collected in Becattini *et al.* (2009), as they span in depth the three waves.

developed countries during the second half of the twentieth century after the golden age of mass production. The third wave is now ongoing with the IDs and the new industries of the beginning of the twenty-first century. All such ages include plenty of forms of IDs, however we propose a view according to which each wave is characterized by some prevailing form under the ID general concept. They are what we call here the three generations of IDs, borrowing and modifying a terminology first used by Sebastiano Brusco in 1990[4].

## 2. Industrial district Mark 1 - Marshall and the industrial revolution

The recovery of Alfred Marshall's reflections on IDs has entertained a large number of scholars in the fields of economics and geography, not to mention history and sociology since the mid 1980s. Marshall's conceptualisation of IDs in his early studies derived from the observation of what he witnessed. It shaped profoundly, and persistently, not only his views on industrial organisation, but more generally his conception of capitalism and market mechanisms (Becattini *et al.,* 2006). In particular, significant passages in his early writings, like the *Economics of Industry* and the *Pure Theory of Domestic Values*, suggest that English IDs characterised by the presence of small firms empirically bore out the hypothesis that the economies of the division of labour cannot always be explained by large firm control. By contrast, Marshall attained compelling confirmation of the importance of sharing social experiences, exchanging information and knowledge as well as of a division of labour without centralized control (Loasby, 1998; Cooke, 2009).

For Marshall, the economies arising from increases in the scale of production depend on a combination of specialisation and appropriate solutions for coordination, motivation, and cognitive support. In the case of internal economies, the solution is the unification of strategic power over decisions and management within a large firm. Internal economies require a high degree of coordination and hierarchy to maximise the efficient use of capital with labour (Hart, 2009). On the other hand, external economies are external to the firm, but «internal» to the pertinent organisational con-

[4] Brusco (1990) referring to Italian IDs between the 1970s and 1980s saw a passage to a more deliberate use of local policy to support the vitality of the ID SMEs throughout the provision of the so-called «real services», that is marketing and knowledge services realised by local or regional public or private-public agencies working within or across IDs. He referred to IDs plus real services as IDs Mark 2, while IDs with strong socio-cultural embeddedness and without (a strong support by) real services were seen as characteristic of the take-off phases of Italian IDs in the 1960s and 1970s, IDs Mark 1. In the present paper we refer to IDs Mark 1as those featuring the first wave along the XIX century in countries leading the first industrial revolution. The actions of public and collective bodies in many of those IDs were registered as meaningful also by Marshall and this is confirmed in recent historical accounts, though their nature was probably different from the real services identified by Brusco. On the relations between socio-cultural and institutional support in IDs see Becattini *et al.* (2009) Section 4 on «Socio-cultural and institutional aspects» (Introduction by P. Giovannini). Brusco's IDs Mark 2 are included in any case in what we call here as second generation IDs.

text, which in IDs Mark 1 coincided with the localised socio-industrial fabric of a compact centre of industry (Marshall 1920, pp. 271-273). The aggregate resources of the industrial district must, however, be large and diverse enough to support a high degree of division of labour among firms. Social institutions (e.g. custom), business associations and public bodies (Marshall 1920, 467-469) are to complement market mechanisms in supporting the external organisation of firms, the flat governance of the division of labour among them, and thereby the realisation of external economies related to the collective scale of production. Marshall recognised that the production machine —i.e. the market and the firms— is interdependent with the society of the place and the *state.*

The hidden centrality of the ID for a great economist such as Marshall, so alert to the empirical side of industrial organisation, is evidence of how important IDs were in the first industrial revolution and throughout the nineteenth and early twentieth centuries. The IDs Mark 1 have been seen usually as an alternative to the growing factory system in sectors less influenced by large-scale mechanisation. Recent historic studies have underlined however what was already perceived by Marshall, that is, that IDs Mark 1 were also seed-bed of the factory system, with a wide variety of organisational, social and institutional forms sometimes overlapping in the same place.[5] Within this large and evolving variety, what can be seen as the specific feature of the ID Mark 1 is the predominance of the local source of the external economies, with respect to upper and more transversal levels of production. This reflects a period when the logics of the modern market and capitalist relations and of the modern nation state were still emerging, while cities were still the fundamental basis of institutional organisation (Braudel, 1977; Pollard, 1981).

From the second edition of the *Principles of Economics* in 1891 onwards, Marshall suggests the de-coupling of external economies from a narrow localisation of industries and from the concentration of many small businesses in the same locale (Marshall 1920, p. 266). With this decoupling, the role of «place» in increasing returns was potentially extended from a single locality of industry to different interlinked territorial levels, much as time has different interlinked scales. Marshall applied this view to the description of market and productive tendencies of his age in *Industry and Trade*; but, contrary to what he was able to do with the time scale, he did not give an explicit systematic account of the interplay among different interlinked places and territorial levels within market economies and capitalist development (Bellandi 2011). Nonetheless the implicit multi-territorial framework accommodated both the evolution of the industrial district model within more structured regional, national, capitalist and market spaces, and the evolution of the factory system into the lead of big national (and afterwards trans-national) firms supported by national infrastructures. With the second industrial revolution big firms, heavy industries, Fordism and mass-production became dominant.

[5] See in Becattini *et al.* (2009) Section 2 on «Early Industrial Districts» (Introduction by A. Guenzi).

## 3. Industrial districts Mark 2 - Post-fordism and the demise of mass production

The second «generation» of IDs are the so-called Marshallian Industrial Districts (MIDs). They became visible and started to stand out in the mid-1970s when the golden age of mass production was showing the first signs of weakness. These IDs were constantly confronted by the concentrated economic and strategic power of large firms, powerful capitalists, and big urban systems. An early and popular explanation of this second wave of small scale production was proposed by M. Piore, C. Sabel and J. Zeitlin, who referred to the re-emergence of flexible specialization and artisanal modes of production as the «second industrial divide». Indeed, flexible specialisation presented a viable (but not necessarily dominant) alternative to mass production, generated by the increasing demand for variation and variety from the many increasing affluent consumers.[6]

On the market side, the success of small scale production came from an emerging demand for more customised and differentiated goods. On the production side, the changing nature of demand altered the competitive game and Fordist-type vertically integrated productions proved too rigid and inflexible. This meant a shift back from the «factory» to «workshop» and with this, a renewed focus on the «locale of production» which includes its society and historical-cultural uniqueness (Becattini 2004).

Becattini in 1990 defined such MIDs[7] as «a socio-territorial entity which is characterised by the active presence of both a community of people and a population of firms in a naturally and historically bounded area» (*ibid.,* p. 38). MID is an ideal-typical model of a «localised industry» and it is characterised by *local industrial specialisation*, a *decisive but not exclusive* role of locally embedded centres of strategy and decision-making in the definition of local private and public investments in technical, human and social capital (*endogeneity*), and a *structured plurality* of autonomous centres of business decision-making (*de-centralisation*)[8].

The first studies centred on the observation of the success and growth of these IDs Mark 2 in Italy as laboratories of the MID model. Italian regions had retained

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[6] Piore and Zeitlin investigated a lot in Italy in the first half of the 1980s, in touch with the Italians. See for example Natali and Russo (2009) on the role of Sebastiano Brusco. Piore and Sabel (1984) was an international success. The historical complexities of the two «divides» have been considered in Sabel and Zeitlin (1997). Interpretative frames in a similar vein were proposed by M. Storper, A. Scott, and M. Best, and on the side of management strategies by M. Porter. See in Becattini *et al.* (2009) Section 3 on «A meeting ground for the social sciences» (Introduction by C. Trigilia) and Section 5 on «Knowledge, learning and creativity» (Introduction by L. Lazzeretti). ID and IDs studies received strong «ideological» support from the 1980s international publications, as they came from prestigious American universities and interacted with Italian studies from the beginning.

[7] The term and the model were proposed by Becattini in the paper on «The Marshallian district as a socio-economic notion». This essay has been re-published in Becattini (2004).

[8] To be noted is that, contrary to some simplified representations, the model does not adopt a *localist* view of local development as depending uniquely on endogenous specialisation. See Becattini *et al.* (2003).

the vestiges of powerful urbanised artisan systems and some industrial traditions of localised industries that had survived during the two World Wars. Furthermore, they had local political systems committed to supply such localised industrial districts with specific public goods and closely knitted social fabric (Bagnasco, 2009).

International research has confirmed the presence of IDs in several other industrialised countries[9]. Also important for an overall assessment of the strength of this second generation of IDs is the seemingly growing presence of nuclei of «district processes» within various types of localities, like big cities and rural areas, disclosing forms of local development more or less different from canonical district models (Becattini *et al.,* 2003).

Looking back to the MID model 25 years later, we are able perhaps to understand its meaning as a representation of IDs Mark 2. The model was intended to highlight the difference from the dominant industrial and urban models of the time. Firstly, trust allowed transaction costs minimisation along a local *filière* of specialised producers and markets against vertical integration and anonymous market relations. Secondly, spirit of the place and social mobilisation of collective resources, creativity and self-help directing investments in local human and technical capital were contrasted against finance, big firms and bureaucratic state agencies governing industrial investments within and across socially fragmented urban spaces. This second generation of IDs included some features of the IDs Mark 1, i.e. those less hybridized with the growing factory system of the XIX century, and more reminiscent of the guilds-merchants-crafts modes of production in the cities leading economic development in Europe before the Industrial Revolution.

However, the past never comes back wearing identical clothes. Actually IDs Mark 2 emerged and developed not only thanks to their inner/exclusive features in front of windows of opportunity opened by market and technological tendencies in mid-XX century recalled before. They also featured inclusion in networks external to the local system and a more profound and conscious support from local and regional policies[10]. So they were able to combine the local sources of external economies with regional and national sources, which had been suggested as a path of modern development of IDs already by the late Marshall.

Considering for example the growth of Made in Italy in mid-XX, the contribution of single IDs cannot be underestimated, however nor should be ignored the role that urban systems, such as Milan, Verona and Venice, Bologna, Florence, have played both as localisation of clusters of high technology and high culture, and as marketing pivots of regional «magic circles» (Dunford and Greek, 2005) of typical industries distributed among sets of IDs. On the other hand, the economic development and role of such cities was surely supported by the industrial strength of IDs

[9] See in Becattini *et al.* (2009), Section 6 on «Empirical Evidence» (Introduction by F. Sforzi), Section 7 on «The Italian experiences» (Introduction by M. Dunford), Section 8 on «The experiences in other industrialised countries» (Introduction by G. Dei Ottati).

[10] See in Becattini *et al.* (2009) Section 10 (already recalled) and Section 11 on «Public policies and industrial development strategies» (Introduction by G. Solinas). See also previous note 4.

located in their regional spaces (Merlo and Polese, 2006). So IDs Mark 2 replicated some of the core features of IDs Mark 1, whilst in addition to those, they presented some of the multi-territorial levers of ID external economies that the late Marshall wrote about but did not prevail in the context of the second industrial revolution in England.

The ID Mark 2 was a model of organising manufacturing production that was able to create jobs and secure economic growth. However, this model was also in turn threatened by changes in markets and demand that had started way before their effects were completely visible. These included the fast pace and pervasiveness of digital technology, the exhaustion of incremental innovations in a winding down technological cycle, and the entry of China and South-East Asia to world market with their cheap products [11]. All this started to shake some of the fundamental pillars of the ID Mark 2. Transformation has been necessary to survive the challenges, and has of course caused a shake-off with some IDs declining or dying. However, being a very resilient and adaptable system, the ID —as an organisational form of industrial development— has in our view found ways to reproduce some of its inner strengths and to combine them with new factors.

## 4. Industrial districts Mark 3 - In the age of global production and social networks

Globalisation has changed the scale of socio-economic activities since the 1990s. It has coincided with the ever increasing flows of goods, services, knowledge and people along what appear to be global networks that span across an increasing number of regions and countries. The emergence of global value chains across regions and countries has thrown places into a global space in a very short period. All this poses in general two challenges to IDs forcing them to adapt, change, re-invest or decline (Becattini *et al.,* 2009a) [12].

One is the fast pace and pervasiveness of technological change and the inevitable encroachment of science-based knowledge in the world of production. Radical and pervasive changes in the scientific base of industries are trickling down towards consumers through rivulets of applications.

The other is the nature, intensity and scale of increasingly globalised production processes. The globalisation of production created a divide between high-cost and low cost economies. It changed global and domestic competition with newly industrialising countries being able to produce at lower labour costs. China and South East Asia were determined to industrialise starting from traditional sectors and this meant that they entered the world market with aggressive export strategies initially in tradi-

[11] See in Becattini *et al.* (2009) Section 9 on «The experiences in emerging and developing countries» (Introduction by W. Sengenberger).

[12] See in Becattini *et al.* (2009) Section 5 (already recalled), and Section 10 on «Global challenges» (Introduction by E. Rullani).

tional industries' market segments. Localised industries, clusters, specialized towns are also found as important bases of the industrial growth in the emerging economies. In some cases they present some of the features of IDs Mark 1 or 2 (a discussion of this is beyond the scope of this paper —see note 12). Also demand became «global»: middle and low-end markets in traditional markets disappeared for IDs Mark 2 due to cost competition. Instead they had to retreat and secure high-end market niches dominated by imperfectly competition and inelastic demand thanks to branding, customisation or design intensiveness.

These issues again marked a push towards changes in the internal structure of IDs, in who are the key players and in what processes can support their endogenous mechanisms to create and re-produce competences and innovations. A full picture of the ID Mark 3 is still in the making; we are here sketching in our view what are features that would allow us to still recognize in them cases of ID, and what are the changes that have nevertheless occurred to enable their resilience.

The competitive advantage of IDs Mark 2 was in their ability to produce innovation and in particular incremental innovation thanks to the endogenous processes of creation and diffusion of practical knowledge in the local innovation system; and to combine this into territorially enlarged circles of exchange with codified knowledge thanks to well-defined trade and knowledge gate-keepers. This has been threatened by the emergence of a new techno-economic paradigm that is re-configuring the technological and market content in almost all sectors. The challenge for local firms and IDs is to accept the obsoleteness of some of their internal accumulated competences and the necessity to engage openly and widely with external sources of knowledge: this implies to extend quality and intensity of the ID external economies produced at regional, national and international scale, and to reduce the local social and cognitive self-containment.

External influences are coming from relations with the national University system, with international networks of innovation-related actors, with international sub-contractors or client firms, as well as with urban creative contexts (Boix *et al.*, 2013). In fast changing and globalised markets, these external forces challenge the established set of well-absorbed knowledge and practises that had steered and operated innovation and production processes in IDs Mark 2. It is becoming crucially important that new channels and new actors are activated to enable the absorption, translation and combination of external knowledge. Secondly, as investment in R&D is becoming increasingly important against a traditional innovation process based on incremental and learning-by-doing innovations, the need to appropriate the returns on such investment are threatening firms' willingness to cooperate and exchange ideas within IDs. This is altering not only the relations between scientific and «practical/tacit» knowledge, but also the delicate balance between cooperation and competition that drives industrial districts' vitality and dynamism.

So IDs Mark 3 are changing their internal structure and adapting their production organisation to take these two challenges. We see already that some are very success-

ful and have secured market leadership worldwide. The size of firms in this third generation of IDs varies from micro to large firms; some concentration of firms in groups and the growth in size of firms has been necessary to enhance financial capacity to invest in design and creativity upstream and advertising and marketing downstream; open knowledge networks lead the vitality of SMEs sub-systems (Lombardi, 2003); regional and national policies of development aim more explicitly to networks of innovators and platforms of innovation (technological clusters and innovation poles) liaising among cities and IDs (Caloffi and Marliani, 2011); the non-market organisation of production processes has extended beyond the locale with the district internal value chain being now plunged in trans-local and trans-international value chains (Trullen *et al.,* 2013), but also developing trans-local external economies (Bellandi and Caloffi, 2009).

These transformations are supported by the growing ease of international communications, sometimes reinforced by ties, maintained by the communities of migrants, between the old and the new home, according either to the logic of ethno-industrialization or to the working of international research and training or cultural networks. It is no longer a matter of organising international trade fairs, as at best IDs Mark 2 were used to do. It is important to be promoters and to participate in the construction of multi-scale social and cognitive networks that stretch from local to global, exploiting local symbolic resources meeting potentially a global attention: these explain the importance of the *locale* as they make the place a global reference point for the exchange of ideas on specific professional and socio-cultural issues, whilst at the same time leading the coalescence of new senses of belonging for local the community (Belussi and De Propris, 2013).

So from external economies inside the district, we suggest we can see the emergence of «*wired economies*» inside the global-local value chain for those IDs which have been able to reconcile competences embedded and accumulated inside the district with external, codified, scientific knowledge coming from university or research organisations. Despite their *footlessness*, also international multi- national enterprises have understood the value of the «stick knowledge» that is cumulated in IDs and have decided to locate there innovation and knowledge-intensive functions (De Propris *et al.,* 2005, Hervas and Boix, 2013). Furthermore ID process are more clearly identified also within local production systems that are localised in metropolitan or in rural areas, such as high-tech sectors, design, multi-media, cultural tourism, agribusiness, agro- tourism.

It has also to be considered the resilience of some IDs which were the helm of the second generation. Their resilience and current on-going success has been somewhat underestimated or down played. They have been able to thrive by embracing a kind of generational transformation thanks to which they now have become or are in process of becoming IDs Mark 3. Indeed, evidence shows that particularly relevant has been the emergence of medium sized companies and groups within IDs, with the latter growing in number in the most successful IDs. Larger size has enabled firms to maintain their roots in the district whilst extending their

production and market organisation at the national and international level (Coltorti, 2013). For example, the international financial crisis that started in 2008 hit severely the Italian industrial complex, and could have represented the end of a meaningful role for Italian IDs in our time. Instead their exports have started to recover as early as 2010 and experienced sustained growth in 2011 with a 15% rise to non-EU countries, and 8.3% rise to EU countries. This took the overall ID export value to the same level they were 2008. Best performing sectors in exports include: high tech machinery and equipment (up 15% in 2010-11); leather products (up 17%); textiles and garments (up 12%); home design (up 5%); food and wine (up 11%) (Belussi and De Propris, 2013).

Despite appearing so different, the model of the ID Mark 3 remains faithful to its basics: that is the importance of the place. As manufacturing is becoming increasingly characterised by customisation and servitisation, the competitive dynamics are again changing and —away from homogenous markets—, innovation, design-intensity, immateriality and specialisation are more and more crucial. It is indeed in these markets that evidence shows that IDS are renewing their competitive advantage, with a blend of old and new, and combination of local with regional, national and global.

## 5. Conclusions

The IDs are seen in this paper as a «species» (Loasby, 1998), adapting to various conditions and forms, finding niches in different ages and places of capitalism. We have recalled a descriptive frame that defines three ages where waves of areas and arenas for IDs have promoted industrial development: the first industrial revolution, the second divide after the second industrial revolution, the contemporary age of globalization and digital divide. The specific advance proposed in this paper is the association of the three waves with three different ideal-types of IDs, characterising widespread successful adaptations of the ID general model to the opportunities and threats of those ages. Of course the real world variety of forms goes well beyond this and other possible, even less synthetic classifications.

The following Table 1 presents an outline of what distinguishes in our view the three generations of IDs. The stylised differences are summarised with the help of four axes. Different models of local industrial development are generally identified along two axes: the industrial organisation and the socio-cultural ones (Becattini *et al.* 2003). We give an articulation here and explicitly acknowledge the changing role which we have observed for two structural factors included in principle within the two first axes: collective action (with public support) and multi-territorial networks helping ID external economies.

This classification is the result of a journey to reach a better understanding of how the conceptualisation of IDs has evolved to mirror empirical observations. We have here collected our very recent reflections as scholars are grappling with a conundrum:

**Table 1.** Three Generations of Industrial Districts

| | *Local Industrial Organisation* | *Socio-cultural embeddedness* | *Collective action* | *Multi-territorial network* |
|---|---|---|---|---|
| ID Mark 1<br>*The IDs as the first-comers in countries leading the industrial revolution* | Various combination of artisan modes of production with the emerging factory system. | Local social-cultural embeddedness of small and medium sized firms and markets necessary but not a distinctive feature. | Local aid combined with old pre-nation state ways of governance. | — National markets.<br>— Export orientation for district products.<br>— Migrations and attraction of skilled labour. |
| ID Mark 2<br>*Re-emergence of IDs in the developed countries after the golden age of mass production* | — Flexible specialisation.<br>— Versatile integration.<br>— Decentralised creativity within local small and medium sized firms systems.<br>— Incremental innovation. | Local embeddedness relatively high with respect to large urban systems and poles led by big firms. | — Local community market inside IDs.<br>— Real services at the local and regional level. | As above, plus:<br>— Regional relations between IDs and larger cities. |
| ID Mark 3<br>*Surfing knowledge societies, global social networks, global inputs and final markets* | — Increasing sectoral variety.<br>— Increasing role of knowledge from outside.<br>— Flagship role of medium sized company or networks. | — From local embeddedness to local anchoring.<br>— Local skills, heritage and authenticity. | — Access to regional and national platforms for networks of innovators.<br>— Engagement with international trans-local service providers liaising across IDs. | — Global exports markets (logistics, marketing, retailing, promotion).<br>— Coordination of global value chains.<br>— Liaising local knowledge community with a global consumers' community. |

how is it possible in the era of globalisation and multi-national conglomerate that some IDs are world leaders? Does place still matter? This paper is the first stop of our journey.

As we compare and contrast the three different generations of IDs, we suggest for instance that IDs Mark 1 are seen as less specialised in terms of modes of production, more dependent on the organisation of local Guilds or Associations, and less dependent on networks external to the ID than those of the second wave. IDs Mark 2, largely corresponding to the (neo-) Marshallian ID, though characterised with respect

to competing industrial models (big firms worlds) by the strength of local factors of production and social belonging, are striving in a world where the inclusion in regional policies and networks of production and marketing are necessary and practiced if not well understood. Still, knowledge for flexibility, variety and innovation depends strongly on local networks. With IDs Mark 3 the «knowledge communities» change their scale in a hyper connected world where information and social images hit and change and post-industrialised and emerging economies combine quick at an enlarged scale.

Maybe if Marshall was observing now how industries and production are organised in specific places and also across places, he would still think up the concept of industrial district. IDs are clear manifestations of some basic forces shaping the evolution of the industrial organisation of places. Industrial change is not space-blind.

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*Section* ARTICLES

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# The international resilience of Italian industrial districts/clusters (ID/C) between knowledge re-shoring and manufacturing off (near)-shoring

Fiorenza Belussi

**ABSTRACT:** The literature regarding ID/C is based on seminal writings of Marshall, followed by Giacomo Becattini's rediscovering of the concept of an «industrial district». But the concept of a «cluster» was also promoted during the 1980s by Porter, and highlighted the importance of geographically clustered and interconnected firms and institutions specialised in a particular field. Despite the model of ID/C has been often described as locally self-contained, various empirical researches and our analysis have pointed out its increasing involvement in the process of internationalization. The recent entry and exit of MNEs, and the phenomena of off-shoring did not question the model of ID/C per se, but it contributed to showing how interwoven the evolution of local economies and MNEs is.

**JEL Classification**: L60; 014; R30; R58.

**Keywords:** industrial districts; clusters; MNEs; off-shoring; re-shoring.

## La resiliencia internacional de los distritos industriales/clusters (ID/C) italianos entre la relocalización del conocimiento y la deslocalización (en proximidad) de la manufactura

**RESUMEN:** La literatura sobre ID/C se basa en los escritos seminales de Marshall, seguida del redescubrimiento de Giacomo Becattini el concepto de un «distrito industrial». Pero el concepto de un «*cluster*» fue también promovido durante la década de 1980 por Porter, y destacó la importancia de las empresas e instituciones geográficamente agrupados e interconectados, especializados en un campo particular. A pesar de que el modelo de ID/C ha sido a menudo descrito como localmente auto-contenido, varias investigaciones empíricas y nuestro análisis han señalado su creciente participación en el proceso de internacionalización. La reciente entrada y salida de empresas multinacionales (MNEs) y el fenómeno de la deslocalización no cuestionaron el modelo de ID/C per se, pero contribuyeron a

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mostrar hasta qué punto está interrelacionada la evolución de las economías locales y las empresas multinacionales.

**Clasificación JEL**: L60; 014; R30; R58.

**Palabras clave:** distritos industriales; *clusters*; empresas multinacionales; *off-shoring, re-shoring.*

## 1. Introduction: The origins of ID/C concepts

The origins of the literature regarding ID/C are based on seminal writings of Marshall (1919, 1920) followed by Giacomo Becattini's (1987) rediscovering of the concept of an «industrial district» in Italy during the 1980s. In addition, the concept of a «cluster» was promoted during the 1980s in the U.S. by Porter (1998; 2000a and 2000b) and highlighted the importance of geographically clustered and interconnected firms and institutions that are linked by commonalities and complementarities and are specialised in a particular field. The literature on IDs/Cs has highlighted some of the most important characteristics regarding the geographical concentration of «specialised industries», both in peripheral regions or in central urban industrial areas (Grabher, 1993; Loasby, 1998; Amin and Cohendet, 2000; Maskell, 2001; Belussi and Pilotti, 2002; Lombardi, 2000; Sorenson, 2005). Following Marshall, in this paper we acknowledged that the great efficiency of the ID/C model was linked to the following: 1. to the high level of specialisation created by a large inter-firm division of labour, especially, but not exclusively among small firms; 2. to the access to a specialised local pool of skilled labour with better job match possibilities; 3. to the availability of local specialised suppliers of raw materials and components and by the co-location of competent subcontractors; and 4. to the privileged access to local knowledge and know-how, as Marshall himself stressed (knowledge resides «in the air» and in the «industrial atmosphere» of the district). This means that, once a specific form of industrialisation is rooted in a certain area, a process of socialisation and knowledge creation takes place, and the sharing of tacit and codified knowledge overcomes the factory walls, involving the new entrepreneurships, the local workforce, institutions, vocational training centres, universities, and research centres. Good ideas are promptly selected, and innovation quickly diffuses among the local firms, pushed by imitative behaviours. Moreover, IDs/Cs are characterised by the co-presence of cooperation and coordination among the local firms operating in the same phase of the production process. This has added another important characteristic to the complete representation of the «efficient working» of the local economic system (You and Wilkinson, 1994). Section 1 describes the origins of the ID/C concepts. Section 2 deals with the agglomeration phenomenon and Section 3 with the local learning features. Section 4 attempts to classify the variety of existing districts/clusters into a solid typology. Section 5 discusses the centripetal and centrifugal forces. Section 6 and 7 describe empirically the Italian case. Finally Section 8 drawn some conclusions.

## 2. Old wine in new bottles? Agglomeration, clusters, and industrial districts

More linked to the Marshallian tradition was the impetus during the 1980s provided by research underlining the «trusting district», which includes the institutional and social aspects blending together with the «pure» economic explanations. The argument here is that the social «embeddedness» of the local community is responsible for the «reproduction» of the local system, related mainly to the building of social networks endowed with trust, ethics, and commonly shared rules of conduct (Granovetter, 1985). This adds another important characteristic to the local system under analysis (Harrison, 1992), which bears an important economic consequence: a high propensity towards cost-saving rules throughout informal arrangements and cooperation (Dei Ottati, 1986a and 1986b; Lazerson, 1995; Brusco, 1982; Piore and Sabel, 1984), and the sharing of a collective identity (Porac *et al.*, 1989; Camuffo and Grandinetti, 2011). Clearly, the argument offered by the theorists of geographical proximity only, in part overlap with the ID/C theorisation, because organisational, institutional, and temporary forms of proximity matter, but they can be realised outside the borders of the local system under investigation (Rallet and Torre, 1999). The discovery of «external economies» opens up several unresolved issues. First of all, they can be linked to «urbanisation» (Jacobs, 1960) or to «localisation/specialisation» (Marshall, 1920). As discussed by Rosenthal and Strange (2004), diversity (urbanisation) encourages growth and also creation of new firms, particularly in the high-technology field, but if this is consistent with Jacobs, it is not inconsistent with Marshall.

In the theory of the ID/C perhaps one of the most important unanswered questions is the spatial definition of the geographical borders. Despite the numerous objective methodologies implemented (like the analysis of the local systems of labour), we cannot elude the subjective interpretation and intervention of the participant observer. IDs/Cs cannot be identified in their embryonic state, but only once they have developed a critical mass, thus, it is only the evolutionary dynamics of these systems that allow us to properly detect them.

However, considering the agglomeration of specific activities in given areas, statistical objective and subjective methods (case studies and surveys) can be applied once the local systems under examination have reached a critical mass (Belussi, 2006). But, agglomeration of different manufacturing units (Krugman, 1991), where external economies are achieved (alongside various off-setting diseconomies) is not clustering. Thus, we can identify the presence of a specific ID/C when significant relationships (Amin and Cohendet, 2000; Antonelli, 2000) and economic transactions can be detected (even indirectly, as in Sforzi, 1989 or Molina-Morales, 2002). These relationships must occur among the firms located in the area. Local institutions are expected to play an active role, being involved in the creation of training and research institutions, and in the promotion of sectoral associations (Brusco, 1992; Asheim, 1996; Belussi 1999a; Braczyk *et al.*, 1998; Morgan, 2007; Hervas-Oliver *et al.*, 2012).

As argued in Belussi (2006), there is a fundamental difference between the heterogeneous manufacturing agglomeration of individual firms (industrial or urban agglomerations) and a local specialised system, where firms are sharing specialised activities, a skilled workforce, subcontracting relationships, infrastructure, and institutions. This means that IDs/Cs must be analysed as a specific territorial unit, different from the provincial, regional, or country state level, and despite the definition of a cluster by Porter himself, for which the clarity of his argument often vanishes (see also Belussi, 2006; Martin and Sunley, 2003).

Therefore, the feature of agglomeration is only a precondition for the existence of an ID/C, and not at all a weak manifestation of this model. If we turn to the distinction between the concept of an industrial district and a cluster, as discussed in Belussi (2006), we are often describing exactly the same local system. Thus, in many cases, clusters and industrial districts can be considered synonymous, and in discovering the differences we encounter many semiotic antinomies (Martin and Sunley, 2003). However in other studies, the sociological interest of the researchers in the study of the influence of social variables such as trust, communitarian behaviour, propensity for cooperation, and so on, can make the difference. In this sense, it can be said that the subtle difference lies in the theoretical approach put in place, and not in the objective differences that are detachable in the various local systems. In contrast, Gordon and McCann (2000) and Iammarino and McCann (2006), following Markusen (1996), have argued that the industrial district (called «social network cluster») is the Italianate stereotype of a cluster, where only small firms are participating in the industrial structure, where cooperative behaviours and trust appear to be dominant among the local actors, and where spatial proximity incentivizes knowledge spillover and knowledge sharing. An alternative theoretical view could maintain that these phenomena can occur with different intensity both in clusters and/or in industrial districts, but they are typically studied by researchers interested in developing a socio-economic analysis (Becattini, 1990 and 2003), away from the neoclassical paradigm of perfect rationality.

However, IDs/Cs can, thus, transform themselves into mere indistinguishable spatial agglomerations, and vice versa.

More or less pure examples of «Marshallian industrial districts» may be found in the real world, but it must be said that the clustering of heterogeneous agglomeration is the norm, because indistinct agglomeration is more common than specialisation. Gordon and McCann (2000) have maintained that there are three basic forms of clustering. Two of these have developed from the (neo-) classical traditions of economics: the classic model of pure agglomeration and the industrial-complex model (industrial cluster). The third model, which is that of the network (or club) was developed initially outside mainstream economics and comes more from sociological perspectives (industrial district). However, can «pure clusters» avoid creating a kind of social relation or embeddedness in their life cycle? Is Silicon Valley a cluster or an industrial district? And what about the San Diego local biotech system which Kim (2015) calls a cluster, but that he describes with all the features of an industrial district? Should we follow what Saxenian herself clarified: an «Italianate» model of an industrial

district or the definition of Brian Arthur (1990) and Klepper (2010) which called Silicon Valley a cluster? I strongly believe that we have to accept a loose terminological definition (Paniccia, 2002).

In conclusion, we have to admit that we live in an academic world where there is great semantic ambiguity. What in Northern Europe was called a «cluster» (Maskel, 2001) or «learning region» (Asheim, 2006), is in fact a Marshallian theorisation of a «mature» industrial district, while, in Italy, the term industrial district was used to define different types of ID/C (Paniccia, 1998).

We have to recognise that the term cluster refers to a more general class of phenomena (where the industrial district belongs to a distinct specification), or to use the term ID/C without any juxtaposition.

## 3. Districts and clusters as local learning systems

When Marshall describes the advantages which arise from external economies and territorial proximity, with the resulting balance between localised increasing returns to scale and spatial distance transaction costs, he comes close to several concepts that in the history of economic thought were developed much later, such as increasing returns (Young, 1928), cumulative causation (Myrdal, 1957), path-dependency (Arthur, 1994) and evolutionary theory (Nelson and Winter, 1982; Witt, 1993). But, these advantages are not destined to last forever, as the history of British industrial districts during the two world war periods has shown.

The endogenous mechanism of building innovative capabilities within the ID/C follows a type of non-linear model of innovation, and it is based on a model of continuous incremental innovation, also defined as «innovation without R&D», constellated by radical Schumpeterian novelties. In other words, firms populating the ID/C have the advantages of an ample availability of knowledge reutilisation and routines replication (Antonelli, 1999 and 2000). Innovations may be created «by design», through a deliberate effort of firms or public agencies, or they may be created by chance, when people master the implementation of technologies or during the normal course of production activity. Changes are actively experimented with because entrepreneurs or technicians must always solve new problems or may encounter unexpected demands by their clients. So, the reuse of old blocks of knowledge or the recombination of dispersed pieces of knowledge may give rise to novelties. New knowledge and existing knowledge tend to circulate in the economic environment in a process that has no end. The advantage of an ID/C lies not only in the fact that: «when an industry has chosen a locality for itself it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighbourhood to one another» (Marshall, 1920, p. 271). The long-term permanence of an activity in a locality tends to anchor and embed specialised knowledge (in firms, workers, and local institutions and organisations). The local accumulation of know-how and tacit knowledge is not an easily transferable or imitable resource. The notion of an «innovative milieu» (Aydalot and Keeble,

1988; Camagni, 1995), has attempted to relate questions of spatial clustering to the process of innovation.

In addition, learning activities related to interactions are of paramount importance. Within IDs/Cs, learning through client-supplier relationships, and by using innovative subcontracting are the norm. IDs/Cs are self-organized systems (Lombardi, 1999; 2000), characterized by a deliberately and historically formed ample inter-firm division of labour connected with firm specialization. Districts are not only an alternative model to large hierarchical organizations, but different systems, because they are founded on higher increasing returns, and on complex inter-related nets of organisations, which enjoy dynamic economies of scale. Therefore, the efficiency reached by these systems cannot be simply compared with that of one large firm. In these localized systems economies of scale reach a large scalar dimension related to the many complex networks of activities, overlapping filières, rival firms, co-operative subcontractors, specialized agents, and localized collective actors and institutions. This corresponds to the second order magnitude of input coordination and activity aggregation.

In many cases these systems also incorporate large size units, or large firms (Lipparini, 1995; Lipparini and Sobrero, 1994; Lazerson and Lorenzoni, 1999). Districts and clusters are, thus, hyper-networks and they take advantage of multiple synergies (Gertler, 2001). This is why IDs/Cs must be distinguished from networks (Biggero, 1999; Jacobs and de Man, 1996).

## 4. «Real» industrial districts/clusters: Unstable, interstitials, and epiphenomenal?

Yet, the attempt to classify the variety of existing districts/clusters into a solid typology is still challenging academic researchers.

A particularly influential article was written by Markusen in 1996, undertaking the effort of explaining «the puzzle of stickiness in a slippery world». The main thesis was the rejection of the «new industrial district», in either its Marshallian, or in the more recent Italianate form, as the dominant paradigmatic solution. The findings suggest that the study of industrial districts requires a broader institutional approach (it is not clear what was really meant). The research results suggest that a purely locally targeted development strategy will fail to achieve its goals. Unfortunately, in proposing an interesting categorisation of agglomeration forms, the phrase «industrial district», instead of cluster (avoiding to quote even Porter), was used, thereby engendering a terrible mess. In addition, with an immense intellectual haughtiness, Markusen killed the benefits of all possible «cluster policies» in favour of the various local economies.

Moreover, when Markusen introduces the category of an industrial district that is «state anchored» she rejects the idea that «cluster policies» do not have any impact on the dynamics of territorial agglomeration, which is clearly not true (UNCTAD, 1998; Oecde, 1999; Dohse, 2000; Trippl and Tödtling, 2007; Borrás and Tsagdis, 2008).

Markusen compares the models of modern clusters with the Marshall model, in which the cluster is rather homogeneous and created prevalently by small firms that collaborate with each other in a supplier-producer relation. In this model, none of the firms is large enough to appear dominant. In a hub-and-spoke cluster, there are a few dominant firms that represent the core of the «regional» cluster and are surrounded by numerous small firms that are linked directly to these such as suppliers of raw materials, externalized services or subcontractors specialized in particular phases. The small firms trade directly with the large firms and depend largely on their client strategy. Clear examples of hub-and-spoke clusters are found in the automotive industry, such as Detroit.

In a «hub-and-spoke cluster», there are few (or only one [sic.!]) dominant firms that represent the core of the cluster and are surrounded by numerous small firms that are linked directly to them, being suppliers of raw materials, externalized services or subcontractors specialized in various particular phases. The small firms trade directly with the large ones and depend on their client strategy

In the «satellite platform cluster», there are no localised MNE headquarters or large independent companies, but only branch facilities of externally based multi-plant firms. They are located in a particular geographic region in order to benefit from governmental facilities, low labour costs, or low profit taxes.

The last category, the «state anchored cluster», is defined around a public, governmental or non-profit organization that dominates the region and the economic relations between cluster members. This entity is exemplified in many U.S. scenarios, such as a large military base that is generally surrounded by numerous small firms that benefit from public-private contracts.

This analytical frame, unfortunately, is static and the analysis of firms» strategies is lacking. There are not valid universal instant snapshots. Hub-and-spoke clusters are not structurally different from many modern «Marshallian districts», as described in several empirical research studies (Lazerson and Lorenzoni, 1999; Belussi, 1999a and Belussi 1999b; Camuffo, 200; Belussi and Sammarra, 2010), and dependent local subcontractors in hub-and-spoke clusters may reach their global suppliers well beyond the cluster borders. In fact, Gereffi has studied «production» and «buyer dominated» international supply chains, showing two models that link global clients with local clusters of producers (Bair and Gereffi, 2001; Gereffi *et al.*, 2005). The Marshallian district, even in Italy, has been generally evolving throughout the consolidation of several leading firms, reducing the number of firms that compose the local industrial structure. In one sense, we can paradoxically argue that they are now less Marshallian. Interestingly, the same processes appear to be quite influential also in China (Wei *et al.*, 2007). The restructuring of the old Marshallian district in Wenzhou, in the period from 1980-2000 has passed from a model centred on small-scale family businesses in rural settings toward larger modern corporations and an extended delocalised external network. The work of Christerson and Lever-Tracy (1997), focused on the emergence of rural districts in China has, on the contrary, presented a new «mixed» model which is in the middle between the «canonical» industrial

district and the «satellite platform». Chinese firms are typically indirectly linked to global markets through Hong Kong and Taiwanese trading companies and buying agents. This network embeddedness allows firms a greater degree of autonomy than being directly dependent on one or a few multinational firms. Although these areas of industrial production in China may not be «Marshallian industrial districts» in the sense of spatially concentrated agglomeration economies, the regional networks of Chinese factories and ethnic Chinese Hong Kong and Taiwanese investors, suppliers, and clients display the same tendencies toward cooperation, trust, and long-term relationships.

Again, let us discuss the case of the «state anchored cluster» of Sophia Antipolis discussed by Quéré (2003). This science park increasingly became, through a process of «distrectualisation», a more complex and mature «industrial district». In contrast, Wei *et al.* (2009) analysed the transformation of Suzhou Industrial Park, arguing that it resembles a satellite district.

## 5. The heterogeneous evolutionary paths between the centripetal building of local capability and the centrifugal loosing of low-value manufacturing activities

Can the history of the development of ID/Cs simply be accommodated under the label of their «geography of production» and the role played by «external economies»?

In understanding ID/C evolution, the analysis of the building of dynamic technological capabilities deserves a close look (Hervas Oliver, 2015), which returns to the issue of the accumulation of knowledge. Following this logic, John and Pouder (2006) have distinguished technology-based and industry-focused IDs/Cs.

Using a wide sample of local Italian systems, we have distinguished in Belussi and Pilotti (2000) different types of industrial districts/clusters. They are classed into three main categories: a) those with low levels of learning activities where tacit knowledge prevails, and learning takes place mainly through socialisation; b) those based on a balance between tacit knowledge and codified knowledge (here, learning appears to be a «pure» interactive process among localised agents with a rich absorption of external knowledge and recombination of innovative sources); and c) those where learning is based on more formal innovative activities (R&D type).

Traditional sectors in Italy (those with high fashion content), for instance, have evolved following a process of verticalisation, which has deeply transformed the historical IDs/Cs (Lazerson and Lorenzoni, 1999; Belussi *et al.*, 2003; Cainelli and De Liso, 2005; Mariotti *et al.*, 2006; Belussi and Sedita, 2009; Cainelli and De Liso, 2006). This has led to the international relocation of many activities previously carried out by local sub-contractors (Guerrieri and Iammarino, 2001; Zucchella, 2006; Sammarra and Belussi, 2006). Considering the evolution of IDs/Cs, we have to pinpoint the increasing connectivity with global supply chains (Arndt and Kierzkowsky,

2001), emerging from low-labour cost countries, and the transformation of distributive channels, including e-commerce, that advocate another kind of Chandlerian revolution in the economy.

In high-tech (science) or high-knowledge (engineering) sectors, including the high-tech/science districts located in the United States or in Great Britain (Cooke, 2004; Feldman and Audretsch, 1999; Saxenian, 1994), and in sectors specialised in biotechnologies, biomedical applications (Powell *et al.*, 1996; Zeller, 2001), electronics, and software production, where the knowledge possessed by the various actors is constantly and randomly recombined, local firms benefit from knowledge spill overs from local relationships with MNEs possessing highly specialised skills. MNEs are often attracted to clusters to gain access to the pool of localised knowledge (Cantwell and Mudambi, 2011). The entry of MNEs in IDs/Cs has given rise also to the processes of technological transfer between MNE subsidiaries and local firms, although this process is not present in every case (De Propris and Driffield, 2006). Clusters in high-tech are characterised by a dual mechanism of local knowledge absorption and sourcing knowledge from abroad (Gertler and Levitte, 2005; Waxell and Malmberg, 2007; Hervas-Oliver and Albors-Garrigos, 2008; Belussi *et al.*, 2010; Chen, 2009). They are now open systems, in stark contrast with the holistic categorisation of Markusen.

## 6. The Italian districts/clusters

While the expansion of the Italian districts/clusters historically dates back to the post-war period (Becattini, 1990; Brusco and Paba, 1997), the embryonic development of many of these clusters dates back to the end of the 19th century.

The «Italian district model» has enjoyed long-term slow growth without a sudden decline or dissolution, as in the UK, as discussed by Belussi and Caldari (2011).

Many Italian IDs/Cs that specialise in light or medium high-tech sectors are smaller than Prato, and less spatially concentrated, as is the case, for instance, of several IDs/Cs in Veneto, Emilia Romagna, and Tuscany (Cossentino *et al.*, 1996; Belussi and Sedita, 2009). Some IDs/Cs that show district-type features are diluted in conurbations, so they do not clearly and distinctly «emerge» from the statistical analyses, such as the packaging machinery cluster in Bologna (Belussi, 2003). More generally, behind the notion of a uniform «Marshallian industrial district phenomenon» there is a striking heterogeneity, including the recent entry of MNEs, and the creation of home-grown MNEs.

As reported by IPI (2002), considering the results of many classification grids and maps, Italy counts about 100—120 industrial districts typically characterized by the presence of «made in Italy» sectors. Local entrepreneurship characterises these local systems. Thus, the Italian case is quite opposed to the U.S. case, based on high-tech sectors formed around local leading universities, with foreign entrepreneurs and an immigrant skilled labour force (Saxenian, 1999). We are not in the presence of a

predetermined, or standard lifecycle, because we can observe a multiplicity of evolutionary paths (Belussi and Sedita, 2009).

## 7. The genesis of the Italian industrial districts

### 7.1. Methodology

In this section an ample survey that applied a qualitative meta-analysis (Paterson *et al.*, 2001) on the existing Italian industrial districts will be discussed. Instead of using statistical data, textual reports developed in previous studies have been analysed, creating new interpretations from secondary sources. The rationale that informed the case study selection strategy was twofold. On the one hand, we searched for IDs/Cs with different characteristics (e.g., recent vs. ancient, high-tech vs. low-tech, small-sized vs. large-sized) in order to include extreme situations and polar types in which the process under investigation could be «transparently observable» (Eisenhardt, 1989). On the other hand, we selected IDs/Cs for which at least one published case study was available, containing information and a description of the processes under investigation (e.g., historical roots, changes over time, process of internationalisation, technological dynamisms, etc.). This critical survey examines 22 Italian cases, using scientific publications that appeared in academic journals and books[1] (see Table 1). The list is not meant to be a comprehensive survey. However, the aggregate picture that emerges allows us to appreciate the presence of different types of evolutionary paths. Thus, Factors 1-8 were deducted from the existing publications —an ample bibliography collected and mainly written in the Italian language, cited in Belussi and Sedita (2009)— while Factors 9-12, involving the analysis of the more recent trends referring to the issue of internationalisation (external knowledge sourcing, presence/absence of MNEs, and creation of home-grown multinationals), were elaborated, extracting the information provided by telephonic interviews with district/cluster representatives or leaders of the local entrepreneurial association. In order to validate the information collected, we ran a double check by searching on the firms» websites (June 2015). The analysis of Factors 1-8, enlarged to a larger sample of districts (55), was first published in Belussi (2009).

### 7.2. The initial take-off

In the 1950s, the growth of Italian IDs/Cs was driven by the expansion of the «small firm model»: a growing number of local small- and medium-sized firms populated the Italian industrial districts/clusters. They were «phase» or «component» producers for the already existing firms, or for new firms entering the market with novelties, or slightly improved products. During that period there was a correlating increase in local employment.

[1] The main sources are reported in Belussi and Sammarra (2005), Belussi and Pilotti (2002), Belussi, Sammarra, and Sedita, 2008; Belussi and Sedita, 2009, and Club dei distretti industriali (2003).

**Table 1.** The Genesis of Italian IDs/Cs

| *Nature of the triggering factor* | *Key triggering factor* | | *Sector and locality* |
|---|---|---|---|
| Endogenous | • Ancient craft traditions (with ubiquitous spin-offs) | Veneto | 1. Sportsystem (Montebelluna)<br>2. Artistic ceramics (Bassano, Vicenza)<br>3. Artistic glass (Murano, Venice) |
| | | Emilia Romagna | 4. Ceramic tiles (Sassuolo)<br>5. Agriculture machinery (Reggio Emilia) |
| | | Lombardy | 6. Footwear, now footwear machinery (Vigevano)<br>7. Nylon stockings and socks machinery (Castel Goffredo, Mantua and Brescia) |
| | | Tuscany | 8. Textiles (Prato)<br>9. Tanning (Santa Croce sull»Arno, Pisa) |
| | | Other regions and Mezzogiorno | 10. Sofa district (Matera-Altamura-Santeramo) |
| | • Natural resources endowment (with ubiquitous spin-offs) | Veneto | 11. Leather (Arzignano) (water and tannin) |
| | • Anchor firm (with employee's learning and subsequent spinoffs) | Veneto | 12. Footwear (Riviera del Brenta -Voltan firm 1898)<br>13. Eyewear (Agordo, Belluno - Luxottica firm in 1950) |
| | | Emilia Romagna | 14. Biomedical (Mirandola - Dideco of Veronesi firm 1960)<br>15. Packaging (Bologna - Ima and GD firms in 1920s)<br>16. Motor-valley (Bologna - Ducati) |
| | | Others regions and Mezzogiorno | 17. Ornamental horticulture (Pistoia - Bartolini firm 1849)<br>18. Jewellery (Arezzo - Uno A Erre 1926)<br>19. Ceramics (Sesto Fiorentino- Richard - Ginori, 1737)<br>20. Furniture (Pesaro - Scavolini firm)<br>21. Footwear district (Civitanova -Tod's - Della Valle firm) |
| Exogenous | • Entry of MNCs | Sicily | 22. Microelectronics (Etna Valley in Catania - STMicroelectronics) |

*Source:* Our elaborations are based on Belussi and Sedita (2009), Belussi and Pilotti (2002), Dei Ottati (1996), and Club dei distretti industriali (2003).

Four main triggering factors can explain the ID/C genesis (see Table 1), either endogenous or exogenous. The endogenous factors include: *a)* the availability of skilled craftsmen b) the pre-existence of certain natural endowments, such as tannin in the forest for supplementing the process of treating leather products (see the case of Arzignano); or c) the presence of an important local dynamic firm (the anchor firm[2]), which at the time had developed unique technological capabilities leading to a process of spinoffs[3]. The main exogenous factor seems to be related to: d) the entry of an external dynamic firm (a multi-national firm). The exogenous triggering factor, so important in explaining the take-off of IDs/Cs in developing countries (Markusen, 1996; Ernst, 2001; Guerrieri *et al.*, 2001; Giuliani *et al.*, 2005), is marginal in Italy. The only case found is the electronic ID/C in Catania in the Etna Valley, born around the French-Italian multinational, STMicroelectronics (Mudambi and Santangelo, 2014).

By the end of 1980s, most of the IDs/Cs had approached a phase of maturity. The most important triggering factor appears to be the pre-existence of an «ancient craft tradition» (Bellandi, 1992). The anchor firm hypothesis can be applied to a few Italian industrial districts/clusters; for example the Voltan firm, founded in 1989, which was the founding firm of the footwear district/cluster of the Riviera del Brenta near Venice (Belussi and Gottardi, 2000); Luxottica, founded in 1950, the founding firm of the Belluno-Padova eyewear ID/C (Camuffo, 2003); or for the Ima and GD firms, established in the 1920s in Bologna, which can be considered the founding firms of the Bologna packaging ID/C (Belussi, 2003).

Existing studies concerning Italian IDs/Cs reveal that spinoffs are generally sustained by the desire of senior engineers to become entrepreneurs (self-employed workers) and there is no evidence that many conflicts have occurred between the parent firms and the new initiative that was created (Lipparini and Lorenzoni, 2000; Belussi, 2003).

The «natural resource endowment» driver concerns only a few IDs/Cs in our data set and seems a quite marginal explanatory factor. Italian IDs/Cs particularly emerged in the regions of the «Third Italy» (Veneto, Emilia Romagna, Tuscany, and Marche), after a long incubation period, starting with the proto-industrialisation derived from the Renaissance (Bagnasco and Trigilia, 1984; Garofoli, 1989). In the Mezzogiorno region of Italy the most interesting case appears to be the sofa ID/C of Matera-Altamura-Santeramo (Belussi, 1999a).

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[2] Tested in the American high-tech districts by Dyck (1997), Klepper (2001), and Braunerhhjelm and Feldman (2006). This was certainly the case of Fairchild Semiconductor in Silicon Valley (Klepper, 2001) whose most famous offspring have been Intel, and Xerox in Palo Alto, and whose technology was then developed by Apple and others (Chesbourg, 2000). Particularly innovative firms allow their workers to capitalize on the firm's existing specific knowledge, starting their own firms.

[3] As described by Viesti (2000), Lazerson and Lorenzoni (1999), and in the case of foreign high-tech districts by Klepper (2001), and Feldman (2004; 2005).

### 7.3. Growth in industrial districts/clusters: Strategic behaviours and knowledge dynamics

In this section, we will present a composite explanation regarding the combinations of growth factors identified by the literature that describes 22 Italian cases[4] (see Table 2).

From a critical scrutiny of the literature on such cases (see Footnote 6), and from website exploration, twelve important factors have been selected and classified under four broad headings: a) the role played by local institutions and demand growth (Factors 1 and 2); b) the innovation capabilities and access to knowledge (Factor 3-diffusion, Factor 4-indigenous innovation, Factor 5-cost-saving innovations, Factor 6-product-design innovation); c) the firm's strategy towards product differentiation/diversification (Factor 7-diversification); and d) the strategy towards internationalisation and access to global knowledge (Factor 8-reaction to global competition, Factor 9-access to global knowledge, Factor 10-offshoring, Factor 11-entry of MNEs, Factor 12- development of home-grown MNEs).

In Table 2 what emerges is not one direction of change, but multiple path-dependent mechanisms, influenced by the combinatorial variety of different evolutionary growth factors.

In most of the cases, the proactive roles of local institutions (Factor 1) and demand growth (Factor 2) have been found to be particularly important, as expected. The provision of real services to local firms and the role of local policies that pushed toward technological upgrading, influenced the take-off of the industrial districts/clusters[5]. This has often implied the creation ex-novo of specialised vocational training schools[6].

Factor 3 corresponds to the role of imitative behaviours. As the literature has extensively discussed, the replication of knowledge and diffused decentralised creativity appear to be the basic traits (Belussi and Gottardi, 2000).

Factor 4 is related to the so-called Schumpeterian innovations, specifically, radical innovations. Radical innovations conceptualised by local firms were more frequently cited than expected (13 cases out of 22), considering what is hypothesised by the «industrial district literature». Once an innovative firm in the ID/C was able to introduce a radical novelty this novelty was quickly spreading among all other producers. Thus, some IDs/Cs became very innovative in their technological core (1. Montebelluna, 14. Mirandola, 11. Arzignano, 4. Sassuolo, 7. Castel Goffredo and Brescia, 5. Reggio Emilia, 15. Bologna, 13. Belluno-Padova, 10. Matera-Altamura-Santeramo and 22. Catania). In most cases, radical innovations did not just involve the final product internationally commercialised by the local firms, but also the tech-

[4] For a reference on the methodology see Belussi and Sedita (2009) and Belussi (2009).

[5] For an ample discussion of the Italian case see also Belussi (1999b).

[6] For instance, in the case of the packaging machinery industrial district/cluster in Bologna (Istituto Valeriani) and in the shoe industrial district/cluster in Riviera del Brenta (Politecnico calzaturiero).

**Table 2.** Growth factors in development for selected Italian IDs/Cs

| *Nature of the growth factor* | *Most important factors in development stage (ordered by relative importance)* | *Most important factors at maturity stage (ordered by relative importance)* | *Presence of knowledge re-shoring and manufacturing off-sourcing* | *ID/C* |
|---|---|---|---|---|
| MARKETS AND LOCAL INSTITUTIONS<br><br>1. Local institutions<br>2. Demand growth<br><br>INCREASING INNOVATION CAPABILITIES<br><br>3. Imitation and diffused learning processes<br>4. Creation of new radical knowledge embedded in technical innovations, in product and processes (indigenous innovations)<br>5. Cost leadership (only process innovations derived from external to the district sources)<br>6. Original non-technical product innovation (new design) and differentiation<br><br>FIRMS STRATEGY<br><br>7. Diversification<br><br>GLOBALISATION<br><br>8. Passive reaction to global competition (strategy involving only internal restructuring )<br>9. Presence of knowledge exploration and knowledge re-shoring | 4-3-2-1<br><br>2-6-3-1<br>2-3-6 | 4-6-1<br><br>1 | 9. Recombination and improvement of Lange US patent<br>10. Diffused also among small firms<br>11 (Nike) acquisition of Bauer<br>12. (Geox, Tecnica, Stonefly, etc.)<br><br>10. Absence<br>11. Absence<br>12. Absence | 1. Sportsystem in Montebelluna (Treviso)<br><br>2. Artistic ceramics in Bassano (Vicenza)<br>3. Artistic glass in Murano (Venice) |
| | 2-1-3-4-5-6-7<br><br>2-1-3-4-5-6-7 | 1-3-4-5-6-7<br><br>1-3-4-5-6-7 | 9. Absorption of knowledge from Castellon district; absorption of knowledge in self-cleaning tech (Toto Japan)<br>11. Mohawk US has acquired Marazzi (the biggest firm of the district)<br>12. Mapei, Rak, Iris Ceramica<br><br>10. No off-shoring<br>11. Bucher industries (Swiss) with acquisition of Hidroirma<br>12. Landini Gruppo Argo | 4. Ceramic tiles in Sassuolo<br><br>5. Agriculture machinery in Reggio Emilia |
| | 2-1-3-6<br><br>2-1-3-4-5-6-7 | 6-8<br><br>4-6 | 10. Absence<br>11. Absence<br>12. Atom (acquisition of Main Group)<br><br>9. Acquisition of foreign firms with special capability for Circular Knitting machine (Vignoni) and the Garment Length circular knitting machine (Mecmor).<br>10. offshoring in East Europe<br>12. Calzedonia, Golden Lady Company, Pompea, CSP International Fashion Group; Lonati group | 6. Footwear, footwear machinery (Vigevano)<br><br>7. Nylon stockings and socks machinery in Castel Goffredo (Mantua and Brescia) |

**Table 2.** *(cont.).*

| *Nature of the growth factor* | *Most important factors in development stage (ordered by relative importance)* | *Most important factors at maturity stage (ordered by relative importance)* | *Presence of knowledge re-shoring and manufacturing off-sourcing* | *ID/C* |
|---|---|---|---|---|
| 10. Off-shoring or near-shoring<br>11. Entry of MNEs<br>12. Development of home-grown MNEs | 2-1-3-5-6 | 6-8 | 11. Entry Chinese firms<br>10. Absence<br>11. Absence<br>12. Absence | 8. Textiles in Prato |
| | 2-5-7 | | 10. Absence<br>11. Absence<br>12. Thimeco; CMC concerie | 9. Tanning in Santa Croce sull'Arno (Pisa) |
| | 2-1-3-4-5-6-7 | 4 | 9. Natuzzi transfer and adaptation of the moving chain of Mercedes, industrializing the production of the sofa<br>10. Offshoring in China and Romania; 2015 partial back-shoring<br>11. Entry Chinese firms<br>12. Natuzzi | 10. Sofa in Matera-Altamura-Santeramo |
| | 2-1-3-4-5-6 | 1-4-6 | 9. Development of local technical capabilities with global brand (watch strap Apple)<br>10. Limited off-shoring involving the largest firms, reverse delocalization (inflows of immigrants)<br>11. No entry<br>12. Dani, Rino Mastrotto Group, Mastrotto | 1. Tanning and leather production in Arzignano |

**Table 2.** *(cont.).*

| *Nature of the growth factor* | *Most important factors in development stage (ordered by relative importance)* | *Most important factors at maturity stage (ordered by relative importance)* | *Presence of knowledge re-shoring and manufacturing off-sourcing* | *ID/C* |
|---|---|---|---|---|
| | 2-1-3 | 6-1 | 9. Development of local technical capabilities with global fashion brand<br>10. Limited off-shoring involving the upper production,<br>11. a. Reverse delocalization (inflows of immigrants), b. entry of small Chinese firms as subcontractors,<br>c. entry of large MNEs through acquisitions | 12. Footwear of Riviera del Brenta |
| | 2-1-3-4-5-6 | 6-7 | LVMH (Calzaturificio Rossi); Ppr, now Kering, of Francois Pinault (Gucci Logictica spa)<br><br>9. Development of local technical capabilities through acquisitions of advanced foreign technologies through firms acquisition (Persol, Ray-Ban, and glasses.com belonging to WellPoint Inc.) and alliance with Google and Intel (Google glass)<br>10. Limited off-shoring<br>11. No entry<br>12. Luxottica, Saffilo Group, De Rigo, Marcolin | 13. Eyewear of Belluno-Padua |

**Table 2.** *(cont.).*

| *Nature of the growth factor* | *Most important factors in development stage (ordered by relative importance)* | *Most important factors at maturity stage (ordered by relative importance)* | *Presence of knowledge re-shoring and manufacturing off-sourcing* | *ID/C* |
|---|---|---|---|---|
| | 2-1-3-4-5-6 | 7-6 | 9. Development of local technical capabilities via international alliances (or being acquired)<br>10. Limited off-shoring involving the largest firms (Malta and Easter Europe)<br>11. Entry of Gambro, Baxter, Mallinkrodt, Braun Carex, Biofil, and Hospital Dasco which have acquired local firms | 14. Biomedical in Mirandola |
| | 2-1-3-4-5-6 | 4-6 | 9. Development of local technical capabilities during the 1980s, links with Silicon valley firms for the introduction of microelectronics in machinery<br>10. Delocalisation: Titan and Mondi Silicart, IMA; backshoring, Danfoss-Turolla (from Slovakia),<br>11. Tetra Pack Modena; Philip Morris Italia- and Interba in Predosa have opened new plant in Crespellano (Bo) | 15. Packaging district in Bologna |
| | 2-1-3-4-5-6 | 4-6 | 12. IMA large acquisition strategy (Indian Precision Gears; German Kilian of Koln, Swill Ilpack, Chinese Tianyan Pharmaceutical Machinery; Acma-GD-Sasib aree now Coesia group; Sacmi Imola | 46. Motor valley in Bologna |
| | | | 9. Development of local technical capabilities with R&D alliances (a Ferrari, b Maserati, c Ducati, d Lamborghini)<br>10. No off-shoring<br>11. All-important firms were acquired by MNE (Fiat- a and b and Audi Volkswagen c and d) | |

**Table 2.** *(cont.).*

| *Nature of the growth factor* | *Most important factors in development stage (ordered by relative importance)* | *Most important factors at maturity stage (ordered by relative importance)* | *Presence of knowledge re-shoring and manufacturing off-sourcing* | *ID/C* |
|---|---|---|---|---|
| | 2-3 | 1-3-5-9 | 9. Acquisition in Holland of new technical capabilities<br>10. No off-shoring<br>11. No entry<br>12. No home-grown MNEs | 17. Ornamental horticulture in Pistoia |
| | 2-3-6 | 7-3-9 | 10. No off-shoring<br>11. No entry<br>12. No home-grown MNEs | 18. Jewellery (Arezzo – Uno A Erre, 1849) |
| | 2-3-6 | 9 | 10. No off-shoring<br>11. Gucci (Ppr, now Kering, of Francois Pinault) has acquired Richard Ginori)<br>12. No home-grown MNEs | 19. Ceramic (Sesto Fiorentino- Richard - Ginori) |
| | 2-1-3-6 | 3-6 | 10. No off-shoring<br>11. No entry of MNEs<br>12. Scavolini cucine; Biesse wood machinery | 20. Furniture district in Pesaro |
| | 2-3-6 | 3-7-8 | 10. Off-shoring and near shoring<br>11. No entry of MNEs<br>12. Tod's (Della Valle family) | 21. Footwear district in Civitanova |
| | 2-1-3-4-6 | 4-7-9 | 9. Access to global knowledge through R&D centres in California, U.S. and Bangalore, India<br>10. Off-shoring in India<br>11. Entry of other MNEs: Omnitel, IBM, many exits<br>12. No home-grown MNEs except STMicroelectronics | 22. Microelectronics of Etna Valley in Catania STMicroelectronics) |

*Source:* Our elaborations are based on Belussi and Sedita (2009), Belussi and Pilotti (2002), Dei Ottati (1996), and Club dei distretti industriali (2003).

nologies related to machinery. During the time, local suppliers of machinery became international leaders, selling their technologies also to competitors outside the ID/C. However, local firms had the advantage of having been the first in experimenting and adopting the new machinery. New radical technological innovations were conceptualised during the «development stage» or in the «maturity stage».

Product differentiation and new designs (Factor 6) are also a frequently cited item, which particularly characterises the phase of maturity. As we know, numerous low-cost sources have been utilised by local firms to be creative, such as being located near design offices, having internal engineering departments, and above all, having good interactions with their clients and suppliers. Useful ideas received from these sources could be combined with their existing internal knowledge, stimulating a low-cost activity of problem-solving. Creativity, diffused engineering skills, and the understanding of customers needs are the major sources of incremental innovations and product customisation (Gottardi, 1996).

Another feature (Factor 5) was captured by the implementation of cost cutting innovations, introduced mainly through the adoption of new machinery and new organizational methods (innovations originated externally to the ID/C). The cost leadership characteristic appears typical of the initial stage of the lifecycle of the majority of the investigated industrial districts/clusters.

Strategies of diversification (Factor 7) were important particularly for the IDs/Cs specialized in traditional sectors (Carabelli *et al.*, 2006). For instance, Vigevano shifted its production from the production of shoes to the production of shoe machinery. Luxottica, a leading producer of frame glasses (sales in 2014 reached the stratospheric value of nearly 8 billion Euros), entered into the business of commercialisation by buying large retail chains (actually Luxottica covers about 20% of the U.S. consumer market of sunglasses).

Only in three cases out of twenty-two was the reaction to global competition by district/cluster firms definable as passive (adoption of hypercompetitive strategies such as cut-throat prices, accompanied by severe restructuring, plant closure, etc.). These strategies characterised the ID/C of Prato (textile), Civitanova Marche (footwear), and Vigevano (footwear machinery).

About half of our ID/C sample adopted off-shoring strategies with success, developing international subcontracting chains (Factor 10). Relocating strategies have involved less strategic (labour intensive) sections of the value chain in low cost countries. This has been a diffused strategy adopted by nearly all districts specialized in the «made in Italy» sectors, such as footwear, furniture, and clothing (Belussi and Sammarra, 2010). In IDs/Cs where the product cycle was less decomposable (ceramic tiles, and tanning and leather production), the relocation activity was marginal. Relocation was marginal also in IDs/Cs that rapidly declined, like Prato and Vigevano. High- and medium-tech mechanical IDs/Cs (Mirandola biomedical, Bologna packaging, Bologna motor valley, Reggio Emilia agricultural machinery) did not turn often to off-shoring. In the Bologna packaging and Reggio Emilia agricultural machinery districts, local leaders were created (home-grown

MNEs), such as Ima, Sacmi, and the Landini-Argo group. In contrast, the most important firms in the Mirandola biomedical district were acquired by Gambro and Baxter and in the Bologna motor district (by Fiat and Audi Volkswagen). Also, in traditional sector districts international inflows and outflows were intense, as shown in Table 2. Entry and acquisition by MNEs involved ten cases out of twenty-two, including the massive entry of Chinese clothing firms into Prato. The formation of home-grown MNEs was significant and involved twelve IDs/Cs. Considering the process of knowledge re-shoring (Factor 9) we found that they were significant for twelve IDs/Cs.

## 8. Some conclusions

This paper has tried to address the following questions: Where do IDs/Cs in Italy come from? Are they innovative? And how so? How can we describe their genesis and subsequent growth? Clearly, the meta-analysis adopted represents a methodology in which the goodness of the results is very much dependent from the interpretative capabilities of the researcher, and it is not automatically embedded in standard statistical procedures, which benefit from the availability of large data sets. But in many cases there are no available data for interesting research questions. In the last 20 years, Italian IDs/Cs were witness to a recursive sequence of cumulative growth with the emergence of variation and significant ID/C heterogeneity. IDs/Cs started with a small group of firms endowed with some artisan skills, or with access to specific natural resources, or being created by a founding firm. The building of endogenous technological capability was an important triggering mechanism. Since the 1990s, the forces of globalisation have presented new and ruthless competitive challenges, testing the ability of IDs/Cs to sustain their market advantage and pushing some of them over the edge. Despite the model of ID/C has been often described as locally self-contained, various empirical researches and our analysis have pointed out its increasing involvement in the process of internationalization. The recent entry and exit of MNEs, and the phenomena of offshoring did not question the model of ID/C per se (with the notable exception of a few cases), but it contributed to showing how interwoven the evolution of local economies and MNEs is (De Propris and Driffield, 2006; Iammarino and McCann, 2010; Mudambi and Swift, 2010).

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*Section* ARTICLES

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# How do multinational enterprises co-locate in industrial districts? An introduction to the integration of alternative explanations from international business and economic geography literatures

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**ABSTRACT:** This article focuses on understanding why multinational enterprises co-locate in industrial districts, stressing, unfolding and describing the potential of the local or regional-level agglomerations of people and firms which permits multinational enterprises to obtain additional sources of competitive advantage when properly fit. In order to fulfil this goal, the paper presents an attempt to link the literature of industrial districts and economic geography with that on international business. Three theoretical frameworks are tested in an empirical case. The paper has implications for the two lines of literature and opens up a key debate for the future.

**JEL Classification**: L60; 014; R30; R58.

**Keywords:** industrial districts; economic geography; international business; off-shoring, MNEs.

## ¿Cómo se co-localizan las empresas multinacionales en los distritos industriales? Una introducción a la integración de explicaciones alternativas desde la perspectiva de las literaturas de *international business* y geografía económica

**RESUMEN:** Este artículo se centra en comprender por qué las empresas multinacionales se co-localiza en los distritos industriales, destacando, desplegando y describiendo el potencial de las aglomeraciones, locales o de nivel regional, de personas y empresas, que permiten a las empresas multinacionales obtener fuentes adicionales de ventaja competitiva cuando se adaptan adecuadamente. Para cumplir este objetivo, el trabajo presenta un intento de vincular la literatura de los distritos industriales y la geografía económica con la de *international business.* Tres marcos teóricos se ponen a prueba en un caso empírico. El documento tiene

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implicaciones para las dos líneas de la literatura y se abre un debate clave para el futuro.

**Clasificación JEL**:

**Palabras clave:** distritos industriales, geografía económica, international business, off-shoring, empresas multinacionales

## 1. Introduction

This paper is focus on understanding why multinational enterprises (MNEs) co-locate in industrial districts, stressing, unfolding and describing the potential of the local-level (*Location* in Dunning's terms) which permits MNEs to obtain additional sources of competitive advantage. Thus, this paper disentangles and clarifies how industrial districts have to be analyzed by MNEs in order to take advantage from the industrial districts resources in the co-location and off-shoring process. Thus, the paper expands the repository of decisions which may upgrade the MNE off-shoring process. In order to accomplish this task, the paper presents an attempt to link both strands of literature: the international business (IB) and strategic management literature with that of the economic geography and regional science, especially industrial districts but also related clusters literature mainstream. The rational of this paper lies on the fact that the IB literature has traditionally referred to *location* as the national level (e.g. Dunning, 2009; McCann and Mudambi, 2004) neglecting the key importance of the specific location (region, district or cluster) from which to take advantage with co-location. In fact, the IB literature does not explicitly recognize the subtleties of the local space. Therefore, in our view, establishing a dialogue between two aforementioned strands of literature, will contribute to build up a more comprehensive framework from which to understand better the potential of industrial districts when MNEs schedule and carry out their off-shoring process. This paper is based at both the geographical local-level (industrial district) and firm-level. Despite interesting advances in the topic (see Sedita *et al.,* 2013; Hervas-Oliver and Boix, 2013), the phenomenon and its multiple concepts integration require further analysis.

As Beugelsdijk *et al.* (2010) state, no one of the aforementioned literatures explicitly focuses on how the firm's organizational characteristics relate to the firm's fundamental geographical characteristics. Complementary, it is also observed that, with the recent exemptions (Meyer *et al.,* 2011; Rugman *et al.,* 2011) the off-shoring literature is not linked to the *location approach*. Overall, the off-shoring literature has been disconnected from that of the cluster literature and is hardly represented by exploratory case studies which are useful but lack of theory integration and thus are not operational. In this chain of thought, the motivation of this paper lies on the fact that the MNEs co-location in industrial districts lacks of a clear theoretical integration because the same topic is fragmented into different economic perspectives (Beugelsdijk *et al.,* 2010; McCann and Mudambi, 2004) as the international business and management (e.g. Tallman and Chacar, 2011; Dunning, 2009), the economic geography and regional science (e.g. Cooke, 2005)

or the industrial district and clusters literatures (e.g. Bathelt *et al.,* 2004; Hervas-Oliver *et al.,* 2008). Specifically, this paper is aimed at integrating these literatures and thus providing a clear and explicit reasoning to understand the process of co-location in industrial districts by MNEs and thus unfold the potential of the location factor.

## 2. Industrial districts, clusters: potential gains and losses

In the industrial district and cluster literature there is a recognition of the fact that most of industrial districts and clusters are connected within global value chains (e.g. Amin and Thrift, 1992; Harrison, 1994; Bellandi and De Propris, on this same special issue; Belussi, on this same special issue; Sedita *et al.,* 2013), i.e. they are local nodes in global networks (Amin and Thrift, 1992). These connections or external linkages are sources of knowledge from outside the industrial districts, clusters or regions (e.g. Gertler and Levitte, 2005; Hervas-Oliver and Albors-Garrigos, 2008). According to Andersen and Lorenzen (2007:5), the concept of *global pipelines* (Bathelt *et al.,* 2004), more related to clusters, takes its origin from the fact that new knowledge could come from outside the cluster, and so encourage firms to establish pipelines to global clusters of excellence. These *non-local sources of knowledge* (Gertler and Levitte, 2005) or *external linkages* (Hervas-Oliver *et al.,* 2008) are usually connected with the MNE subsidiaries which operate in a cluster and convey knowledge in a two-way street through their internal MNE channels (Cooke, 2005; Nachum and Keeble, 2003ab). These subsidiaries usually act as knowledge diffusers and transfer knowledge from cluster to cluster or from the local to the global level. From this geographical local-level perspective, on the one hand, it is recognized the fact that the MNE subsidiaries bring and diffuse knowledge to the industrial districts (e.g. Belussi and Sedita, 2010). Opening industrial districts is a way to reduce lock-in (Bathelt, *et al.,* 2004) and thus the external linkages are knowledge-changing mechanisms which expand and upgrade the cluster's existing capabilities (Bell and Albu, 1999) which complements and get combined with the local buzz. On the other hand, the interaction between the local externalities and the inward FDI has a synergistic effect which promote the location-based regional growth, due to the multiplicative effects in the region from receiving FDI (e.g. De Propris *et al.,* 2005; Bellandi, 2001; Driffield and Munday, 2000; Cantwell and Piscitello, 2005).

Nevertheless, MNE are receiving but also transferring knowledge (e.g. Shaver and Flyer, 2000) because of the existence of information spillovers so that the overall net effect of unintended knowledge outflows could be perceived by the firm to be negative and prevent it from localize in the cluster, due to the fact that MNE firms in the cluster could perceive that knowledge outflows can benefit rivals industries and reduce their own competitive advantage so that try to prevent unintentional knowledge flows. This is related to the *adverse selection* problem (e.g. Chung and Kalnins, 2001, Shaver & Flyer, 2000). The reasoning of the latter idea, as Shaver and Flyer (2000) posits, is that firms also contribute to the agglomerations by spilling over their technology and sharing their suppliers with local competitors. Overall, from the geo-

graphical local-level point of view, usually the co-location implies gaining access to the local resources from whatever form they present. Nevertheless, at the firm-level, considering the firm heterogeneity the opposite may happen. It is important to distinguish the level of the analysis. Moreover, it is crucial to understand the research gap on considering a *net effect* (with both gains and losses) when MNEs co-locate in industrial districts and clusters. This net effect is discussed below.

## 3. The role of the MNEs in industrial districts: dealing with the territory

Industrial districts offer a growing opportunity to disaggregate value-chain activities into fine-sliced parts due to their competitive advantage which arise from their agglomerations (e.g., Farrell, 2005) and the flexible integration of production (e.g. Becattini 1990, 2001 and 2002). The literature about the MNE learning process from locally embedded knowledge pools (McCann and Mudambi, 2004; Dunning, 2009; Jensen and Pedersen, 2011; Tallman and Chacar, 2011) is scant and recent. Only few studies have tackled the topic. For instance, Nachum (2000:375) examined FDI in US in the professional services industry pointing out that «agglomeration economies and location advantages together shape the location choice of MNEs in the US». Nevertheless, from the management literature, the local knowledge from clusters and how it is disseminated to affiliates abroad has been tackled (e.g. Miller and Shamise, 1996) and some ideas can be extrapolated to the industrial district. In addition, from the IB and management literature the knowledge creation and diffusion within MNEs in general, addressing the type of knowledge transferred between affiliates and their headquarters (e.g., Kogut and Zander, 1993; Solvell and Zander, 1998) has also been addressed, although the clusters or the industrial districts' resources have not been fully considered.

### 3.1. Agglomeration and co-location: an IB approach

The IB literature has usually addressed the fit between the firm off-shored and the host destination implicitly referred to the firm level, instead of the activities (e.g. Rugman *et al.,* 2011) and the geographical national-level, instead of the specific locations within the country. IB literature has focused basically on the idea of clusters more than industrial district, although most of the conclusions could be adapted to the industrial district assuming a certain flexibility. In fact, really few studies from the IB literature have pointed out the geographical location to the specific clusters, such as Nachum (2000:375) who examined FDI in US in the professional services industry pointing out that «agglomeration economies and location advantages together shape the location choice of MNEs in the US». Similarly, Nachum and Keeble (2003a,b) have also stressed this fact when describing how the film industry from the US co-located in Central London in the Soho media cluster. The research on the spe-

cific concept of industrial district is basically neglected in this line of the literature, so that I will try to assimilate, as far as possible, the results for clusters to the industrial districts. The interesting point on addressing specifically the industrial districts in which MNE subsidiaries co-locate is the fact that there are agglomerations which offer attractive potential resources to tap into, as aforementioned in section 2, are frequently not available in other parts of the host country.

Once the types of industrial districts or clusters, and the externalities they offer are evaluated in each territory, it is central to understand the fit between the off-shored business activities and the attributes of the different industrial districts chosen to co-locate. Rugman *et al.* (2011) argue that each subsidiary's value chain activity vary in their integration-responsiveness positioning due to the subsidiaries' internal resources and the external ones available in the host location. Thus, Rugman *et al.* (2011) integrates the association of the four major FDI types (natural resources, market, efficiency and strategic asset seeking (Dunning 1993) with specific activities that the subsidiaries perform in their value chains (innovation, production, sales and administrative activities). In all, each subsidiary can present a different value chain pattern depending on the type of FDI sought in each activity off-shored. In this sense, it is worthy to notice that the stress is made at the activity level rather than the subsidiary level, as Mudambi and Venzin (2010) state. Similarly, this idea is reinforced by Jensen and Pedersen (2011) which posit that firms are not off-shored but activities are, gaining prominence the fit between the off-shored business activities and the attributes of the different destinations.

The focus on the national-level, instead of the local-regional geographical space, the explicit lack of attention to the local agglomerations hamper the IB literature advance and deprive the IB from addressing fully the regional-global phenomenon. Therefore, the IB literature should make explicit (1) the specific local-regional agglomerations as one of the key reasons to understand why MNEs co-locate; and (2) the way in which agglomerations' characteristics fit with the off-shored activities. An example of the sources of agglomerations, in this case the skilled labour pool found in the Soho media cluster (from Nachum and Keeble, 2003b:466) illustrate better the aforementioned idea of agglomerations in section 2 (when interviewing a director from a US subsidiary in the film industry co-located in the Soho cluster, London):

> «here [in Soho] we can find the best employees. There is a very large pool here from which we can choose. [...] they are all here around, and we can hire new ones whenever a need arises. There is no point in trying to find employees elsewhere ...».

Similarly, the description of a wider set of sources of agglomerations in Soho is expressed as follows:

> «We buy most skills locally. All external facilities we need are here [in Soho] —the highest concentration in London. It is convenient to have everybody within 5 minutes walk. [...] we have minimum links outside Soho, let alone outside the UK. [...] all that we need is within reach of our office» (2003b:467).

Eventually, the specific activities that the US subsidiaries find in Soho are mainly post-production:

> «our external purchases, that is post-production, printing, re-production, take place mainly locally, but sometimes we buy specific skills overseas if it is better/cheaper. For example, we use printing services in Germany. Only about 5% of the external purchases are from overseas, but these can sometimes be very important...» (2003b:467).

Nevertheless, as previously stated, the heterogeneous firms also face *adverse selection* (e.g. Shaver and Flyer, 2000) and its consequent net effect addressed above. This means that MNEs co-locating may suffer from knowledge spill over to their competitors and the general idea that agglomerations benefit local firms may be misleading in certain circumstances, which is possible in this type of IB literature but is rather incompatible with the point of view of the industrial district. The rational of this idea is based on the fact that there are firms which contribute more than others to these external economies (Chung and Kalnins, 2001). Shaver and Flyer (2000) pointed out firms possessing superior technologies, human capital, training programs, suppliers, and distributors have the incentive to locate distant from other firms, avoiding the negative, in this particular case, agglomeration effects. Nevertheless, the latter work refers to «entire firm» location, without distinguishing between its different activities, in part due to the industry used in that study, the lodging industry in Texas, and services are more difficult to disaggregate into fine-sliced parts. We think that it is more appropriate to use activities rather than firms, as Jensen and Pedersen (2011) suggests.

### 3.2. Co-location is not enough: embeddedness is needed

On the one hand, the «cluster» resources a MNE subsidiary can access in specific locations is consistent with the «resource bundling» theory of the MNE (Meyer *et al.,* 2011), which claims the uniqueness bundling of internal and external resources which determine the subsidiary's strength. On the other hand, co-location does not mean instant access (Kogut and Zander, 1992; Sorenson *et al.,* 2006). The reason to understand the latter idea is the fact that most of the knowledge flows exchanged in industrial districts (also in clusters) are based on face-to-face interactions (buzz: Storper and Venables, 2004) and it implies *embeddedness* in local networks. The IB literature has also recognized that new knowledge is created and developed in relationships, to the extent that it is pointed out that a firm's success in accessing overseas markets requires to be established in one or more networks, becoming and insider to develop its relationships to build trust and commitment in order to learn, avoiding being an outsider and thus suffering from the *liability of outsidership* and foreigness (Johanson and Vahlne, 2009). In this sense, recent empirical evidence has revealed that firms can learn by participating in their customers' networks and thus overcoming information asymmetries (Fjeldstad and Sasson, 2010). This explicit recognition of the *outsidership* by the IB literature, addressing directly the necessity to be embedded in the place, is one of the most important and traditional milestones of the economic geography and industrial districts literature.

In order to illustrate better this idea of embeddedness by focusing on MNEs in industrial districts, we use a quote from Nachum and Keeble (2003b:465) recogniz-

ing specifically this fact when describing an American MNE subsidiary co-located in the Soho cluster in London:

> «People give work to those they know [...] There are about 100 companies producing TV commercials, and we take those we know. Why deal with strangers? [...] Commercial and social relations are mixed—this industry is about whom you know. You are not judged on your skills you need personal contacts. [...]A base in Soho helps hiring the "right people". They are all around, you get to know them, you get to know other people who know them. The managing director of a US advertising agency similarly expressed the view that [...] it is a very social business. [...] Networking is the key to the business» (2003b:465).

Nevertheless, as Tallman and Chacar (2011) make explicit, the necessity to the locally connected is mainly for accessing the local tacit knowledge, due to the fact that most of explicit knowledge comes from the MNE internal networks, but when addressing *tacit knowledge, foreign affiliates are dependent upon local linkages in a similar manner to indigenous firms* (Nachum and Keeble 2003a: 185). The importance of the local conditions to access knowledge that is not available from the headquarters means that the affiliate needs to rely on local specific resources, implying a strongly embedded behaviour (Prahald and Doz, 1987; Barlett and Ghoshal, 1989; Birkinshaw and Hood, 2000) which has been explicitly recognized in the IB literature (e.g. Andersson, and Forsgren, 2000; Nobel and Birkinshaw, 1998) and thus increasing the subsidiary dependence on local generated (tacit) knowledge (Kogut and Zander, 1993; Solvell and Zander, 1998).

### 3.3. Each industrial district is different: context matter and the «knowledge distance»

*Context* or the specific division of labour and the networks in an ID are influencing the informational environment of the co-located firms and their individuals, providing a reference point (Storper, 2009:13).

As Tallman and Chacar (2011) states, all knowledge has at least some *tacit* aspects. Tallman and Chacar (2011) presents a model which point out the fact that each cluster as a specific type of knowledge which provide the common assumptions an understanding for the co-located firms. This *architectural knowledge* is derived from common practice and provides the understanding or language to absorb related component knowledge effectively (see Henderson and Clark, 1990; Pinch *et al.,* 2003; Tallman *et al.,* 2004). That model is based on the idea that the architectural knowledge (common understandings which define a community of practice; Henderson and Clark, 1990) is the framework which allows the exchange and mobility of tacit (component) knowledge within communities without codifying and decoding such component knowledge. In MNEs the key sources of locally developed high-tacit content component knowledge arise from subsidiaries' insertion in local communities of practice that are embedded in local networks of practice, as Tallman and Chacar point out.

In this chain of thought, when subsidiaries are locally embedded, the local interaction with local firms and organizations can create particular firm-specific ad-

vantages (FSA) based on location-bound knowledge or activities, which may benefit the subsidiary in a particular location (Rugman and Verbeke, 2001) due to the specific agglomeration effects. This location-bound FSAs in the subsidiary repository of knowledge is tacit and context specific (locally embedded) and therefore is a knowledge difficult to diffuse internally to the head quarters due to mobility barriers (Nelson and Winter, 1982). In order to absorb knowledge from industrial districts, the co-located subsidiaries need to share the same common understandings and knowledge from the industrial district and understand its specific context. In the same way, facilitating the diffusion of knowledge in an industrial district by MNEs will require to share the common understandings and context of the industrial district.

## 4. Empirical case

### 4.1. Introduction and methodology

The empirical case presented in this section represent an attempt to test the theoretical framework developed, in order to offer a real-life case which considering both components, industrial districts and MNEs, illustrate the theoretical integration. The case is based on the close connection between the Castellón ceramic tile industrial district (Valencia, Spain) (hereafter, for synthesis, Castellón) and the Italian counterpart in Sassuolo (Emilia-Romagna, Italy). Both territories have been connected for the last 20 years through different events (international trade fairs, congresses) and especially from their own MNEs which have co-located in both industrial districts trying to tap into each district specific agglomerations.

The research methodology used in this study is qualitative, exploratory and holistic in nature (Eisenhardt, 1989; Yin, 1994). Our empirical base comprises primary data (interviews with managers and panel of experts) and secondary sources (case studies, industry reports, analysis of firms' webpages and specially their international branches and firm databases from Bureau Van Dijk, Amadeus). The interviews were done to the most important five MNEs in Castellón and to the board of directors from ANFFECC (frits-glaze trade association in Castellón, in the summer of 2011). In addition, we also conducted clarifications and extended interviews to a panel of 10 experts (5 university professors, 2 representatives from the industrial districts' institutions and three middle executives from consulting firms specialized in the ceramic industry). We achieved triangulation of data through specific questions with interviewees, discussion with experts in the industry and policymakers and also comparing results with secondary data (e.g. Baxter and Eyles, 1997).

### 4.2. Introduction to the industrial districts of Castellón and Sassuolo

In the ceramic tile industrial districts, the value chain is formed mainly by the following central actors: clay atomizers, ceramic producers, frits and glazing indus-

try (chemicals), and equipment manufacturers. Ceramics production worldwide is concentrated in just a few countries, and mainly formed by industrial districts. The most important industrial districts in Europe are Sassuolo in Italy (ISTAT, 2006) and Castellón in Spain (Boix and Trullén, 2011).

Castellón is one of the leading the ceramic tile industry in Europe according to production figures and has been recognised as an industrial district phenomenon (Meyer-Stamer *et al.,* 2004; Hervas-Oliver and Albors-Garrigos, 2007), representing roughly the 90% of the Spanish production. Besides Spain, Italy represents one of the strongest ceramic industries in Europe and plays a leading role in the world of ceramic design. Around 80% of Italy's ceramic tile production is concentrated in Sassuolo. Castellón and Sassuolo together account for roughly 80% of the European production (used to be 90% in 2000).

The auxiliary industry also displays a different composition in both industrial districts due to their different roles in the world ceramic industry. Castellón enjoys a prominent position in the glazing industry as illustrated by the 26 local frits-glazing (chemical) firms employing 3,200 workers (ASCER, 2010), while Sassuolo is more focused on the ceramic equipment industry, represented by 171 firms employing 6,000 workers (ACIMAC, 2010). Put differently, the world-class knowledge for ceramics in Castellón is chemistry and the one in Sassuolo is equipment. These two differing knowledge bases have traditionally influenced the type of growth in each industrial district and the disruptive innovations occurred at both places.

Also noticeable are the differences observed in both industrial districts regarding the institutional infrastructure. The local university in Castellón, Jaume I University (UJI), offers a ceramics chemical engineering degree unique in the world. The University also has links with the Ceramic Technological Institute (ITC), a local ceramics R&D centre with a worldwide reputation and employing more than 100 researchers. The Italian counterpart, the Ceramic Centre (CC) does not conduct the type of research done in the ITC and only employs around 20 researchers. The close ITC collaboration process with the UJI has been deemed to work better in Castellón (e.g. Meyer-Stamer *et al.,* 2004). The glazing industry is the main user of the ITC and is the sector at the heart of the industrial district, which undertakes most of the R&D, transferring its knowledge through its interrelationships and connections with the tile companies. At the same time, these linkages are strengthened by the support given by the ITC to the tile companies as well as the hiring of experienced technicians throughout the various industries. All this entails a fluid circulation of tacit and explicit knowledge, based on the use of a common language, culture, understanding and personal relationships among local workers, who are implicitly working towards the same targets. This innovation system has not been observed in the case of the Italian CC, although communication between ceramic equipment producers and ceramic tiles forms a productive interaction (Meyer-Stamer *et al.,* 2004; Russo, 2004) reinforcing the Italian industrial district.

### 4.3. Analyzing data

The sample used to conduct the work was based on information provided by trade associations in both industrial districts (ANFFECC in Castellón and ACIMAC in Sassuolo) and especially from the guide provided by ANFFECC during the interviews. We have verified the constituents of the secondary data retrieved from Bureau Van Dijk database Amadeus and SABI. Our sample is almost the total population of glazing firms in both industrial districts, 20 (out of 26) in Castellón and 18 (out of 20) in Sassuolo. Methodologically, the study of the secondary data complementing interviews consisted of extracting from *SABI* and *Amadeus (Bureau van Dijk* databases) information provided by the trade associations about the firms located in Castellón and Sassuolo for each industrial district in the frits-glazing industry according to location and SIC (Standard Industrial Classification). This way, the method retrieved information sorted by industry, the nationality of the parent company, or the main shareholders, as well as their subsidiaries or foreign branches.

We focused on the Castellón frits-glazing firms and their subsidiaries in co-located Italy, as well as on the Italian frits-glazing firms from Sassuolo and its branches located in Castellón. As a result, we can analyse the role of the indigenous firms in the industrial districts, and discover if these firms are also represented through foreign branches or subsidiaries in both locations. Then, by crossing databases with the standard industry classification (SIC) we can establish if the subsidiary is simply commercializing, or represents a production plant or extension of production facilities. The database information was more limited for other countries. Moreover, other limitations need to be pointed out. If a firm has opened a foreign affiliate that does not belong to the parent or holding company because the shareholders have made the investment as a separate firm, then this new firm does not appear as a foreign subsidiary. We only can identify and monitor those subsidiaries that have a minimum ten per cent parent company shareholding —as mentioned by Nachum and Keeble (2003a). Nevertheless, this limitation represents the exception to the general pattern— according to informal conversations held with various directors. All in all, these 46 firms are the most active ones in frits and glazes for ceramics in the global industry. Once the process of co-location in each of the two industrial districts is analyzed, we proceed with showing the main findings and then contrasting results in the interviews accomplished, in order to validate and extend qualitatively results and thus generate implications.

### 4.4. The Glazing industry in Castellón

With 2010 data from ANFFECC (2011), which is the frit-glazing trade association, Castellón has 26 firms specialized in frit, glaze and colour industry, including 3,200 direct employments. This is equivalent to 70% of the Spanish firms and 90% of the employment in the industry. Most of the firms in the industrial district

(21 firms) belong to the ANFFECC association. The firms of the industrial district are distributed in a small geographical area of 25 Km of radius. In the figure 1 is showed their distribution. The Castellón sample contains 20 firms, which account for 77% of the population, with a global average of 151 employees by firm —40% having less than 100 employees, 40% with between 100 and 200 employees, and 20% with more than 200 employees. Nevertheless, according to the consolidated accounts several business groups have more than 600 employees internationally. Overall, some 80% of the glazing firms in Castellón are indigenous firms and some 20% are MNE subsidiaries, mainly from Sassuolo, except for one firm with a parent company in the United Kingdom and another from USA. Around 65% of the glazing firms have subsidiaries in foreign countries, while the others are exclusively located in Castellón.

For the Italian industrial district, the sample consisted of 18 glazing firms (90% of population). Some 60% of the sample firms had less than 100 workers, while the rest had between 100 and 200. The average payroll size was 78 employees —firms being smaller than in Castellón. Overall, ten of the firms were considered as indigenous, belonging to an Italian parent or holding company— and eight were identified as MNE subsidiaries, directly from Castellón. Four companies of the ten Italian indigenous firms have foreign branches —and the remaining were local firms with no direct international presence. The four companies with operations abroad are, all of them, located in Castellón and especially one is important: Colorobbia, due to its leading role in Castellón together with the indigenous ones.

According to the informants, the glazing industry in Castellón contains three types of firms: those which only work for the domestic market (small frits-glazing firms), those which export to international markets and provide technical assistance in the destinations and, thirdly, the most «global» group which is formed by 5 MNEs which act as *international* companies (Barlett and Ghosal, 1989 classification) which exploit the parent company knowledge through diffusion and adaptation, exporting and also off-shoring parts of their value chains depending on the industrial district they co-locate. The latter group contains 5 world-class companies in the field: Colorobbia (Italian firm based in Castellón), Torrecid (Spanish), Esmalglass (Spanish), Endeka (Spain + United Kingdom) and Ferro (Spain + USA). Colorobbia is indigenous from Italy, with research and innovation, production and sales activities in Castellón and the rest are indigenous from Castellón with fully Spanish equity (Torrecid and Esmalglass) and also with equity from UK (Endeka) and USA (Ferro, listed in the New York stock exchange). All companies are located in Castellón and contribute with the 70% of the Castellón international commerce of frits and glazes.

Castellón, in general, represents around 40% of the world production share of frits and glazing. Basically, the international group of 5 companies represents around 50% of the Castellón production of frits and glazes and 30% of the world production of frits and glazes. The 5 companies have subsidiaries in all countries where the production of ceramic tile is important. For instance, Esmalglass has affiliates in

Italy, UK, Portugal, Russia, Brazil, Indonesia and China. Similarly, Colorobbia has affiliates in the same locations plus Taiwan, Turkey and Mexico. Torrecid has also affiliates in the same locations that Colorobbia has plus Thailand, Vietnam and India. Those companies, as well as the rest of the industrial district, present the main production and research facilities in Castellón province.

All of them have been off-shored step by step following the incremental (Johanson and Vahlne, 1990) Scandinavian model, following first a typical process of internationalization which started with exports, then permanent subsidiaries for technical assistance and support, and finally wholly owned subsidiaries with production abroad. The latter form, the production subsidiary, with two models. First model of commodity production, and the more sophisticated second model, consisting on fusion frits, which are the components which present the most knowledge-intensive stage of the production process and the one which add more value, incorporating nano-technology in the frits incorporated in the tiles. All interviewees recognized that, in general, these firms only co-locate in industrial districts, due to the fact that the industry is mainly formed by industrial districts (see Meyer-Stamer *et al.,* 2004).

Therefore, the first impression we got from these figures reinforce the fact that the glazing industry in Castellón is mainly indigenous, although industry companies have expanded overseas with 63% having branches in Sassuolo. In addition, some 40% of Sassuolo firms are also located in Castellón. It can therefore be shown how Castellón is leading the glazing industry by judging the number of firms and workers involved and the co-location patterns. In the next section we proceed with interview to clarify exactly why this process and what it means. Despite recognizing the fact that those firms also co-located in other industrial districts (in Brazil, Indonesia, and Turkey, for instance), this paper is focus on the Spanish-Italy relationship as a way to set a specific scope for practical purposes. According to the interviews, it is confirmed the complementary links between ceramic tile in Castellón (Spain) and Sassulo (Italy). And it was specially pointed out the fact that off-shoring to other industrial districts, requires insertion of the local knowledge, networks and ways of understanding the industry. For instance, one of the interviewees stressed the fact that:

> «Going to Italy (Sassuolo) to is not only for following up our customers abroad [...] it is an opportunity to learn from the mechanical process they have implemented using frits and glazes and also to get to know what's new on production equipment which can upgrade our services [...] It is impossible to sell design in Italy, they know much more than us, so our technical service is based on the chemical components of the product and never on the aesthetics or more symbolic forms of design [...] no way there».

Tacit knowledge gained from operations and activities in Castellón is generated locally through local inter-industry interaction, including organisations, and this knowledge is partially transferred to Sassuolo in three ways. First, the glazing Italian firms (3 medium players except for the global-player Coloribbia) co-located in Castellón with headquarters in Sassuolo. Nevertheless, strikingly the R&D activities are conducted in Castellón, where all of them produce frits and glaze, profiting from a

more knowledge-rooted environment in chemical terms. Secondly, the Castellón exports of frits and glaze to Italy is supported by the Castellón MNE subsidiaries whose off-shored activities are basically technical and post-sale support, neither production nor R&D activities which are concentrated in the Castellón knowledge domain. Therefore, the tacit (component) knowledge created in Castellón is therefore disseminated gradually to Italy through the Castellón subsidiaries focus on technical support to assist the exports of frits produced in Castellón and through the Italian subsidiaries which report to the Italian headquarters. In the interviews the following assertion was made by a leading firm executive:

> «There is no reason to have production facilities in Italy. Exports work very well and our sales branch and engineers working there providing technical support reported us the latest news they have from there every week. Producing frits in Castellón has many advantages and it is a good way of getting synergies, experience and economies of scale. In addition, we (in Castellón) are more advance on this matter than the Italians and they are so close to us, so why being there?».

What was really interesting is the implicit idea that the board of directors at the trade association had about being in Sassuolo. Put differently, being there was the right thing, but the point is *how* the MNEs are there. Although they did find the right way of expressing their idea, we quickly realized that they were talking about modes of entry and, much more interesting, about which *specific activities* off-shored. One of them was really specific:

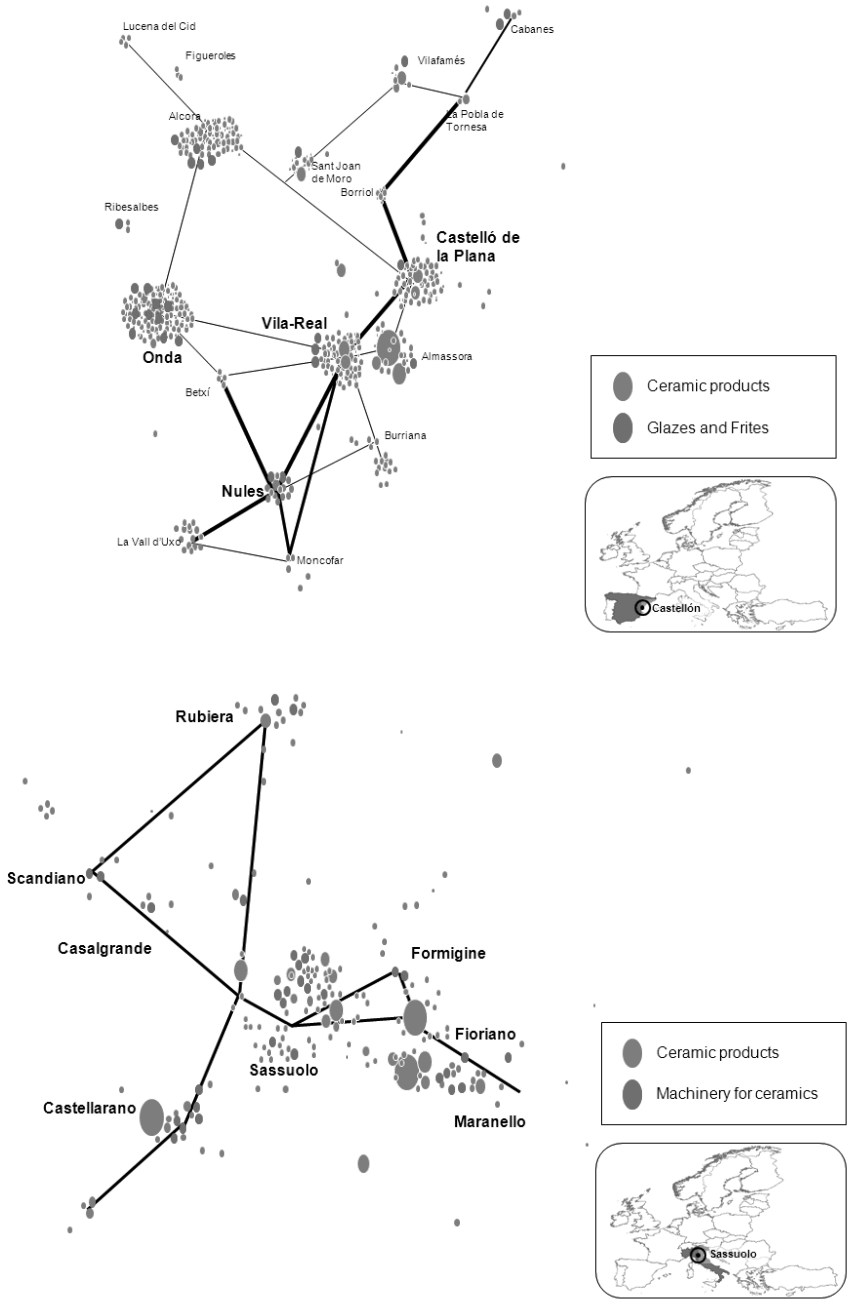
> «Taking there [off-shoring to Sassuolo] the support services is right. Our customers there have a door to knock on when they have a problem. Nevertheless, taking there the production of glazes, and mainly the fusion of frits, has no sense because we have too much to lose and really little chance to gain something. Glazing firms in Italy will have too much to gain and little to lose».

The interviewees agreed with the idea that is not about off-shoring the firm, but the specific activities. The highest-value adding activities, R&D and fusion frits, are located in Castellón because it is more efficient in terms of production and knowledge. On the contrary, off-shoring them to Italy will mean potential problems of contributing too much to the host with knowledge spillovers, apart of not using the local knowledge resources for frits-glazing in Castellón.

Apart of learning from the frits-glazing context in Castellón, the Italian subsidiaries also learn from the red-body tile context interacting with local tile producers. Similarly, the Castellón glazing firms also learn from the white-body tile context and mechanical context in Sassuolo, interacting with local tile producers. All the executives interviewed remarked the importance of being there but *being where things happens*, meaning the crucial importance of being locally embedded. Specifically, one of them suggested:

> «Our team of expatriates is always well connected. They attend seminars, conferences, visit frequently the customers and even developed local personal ties with locals from the industry. It is also important to engage with the leading firms in the Sassuolo ID, because they have always the best knowledge and are anticipated to the trends than finally are imposed in the ID, in terms of fashion and style, market tendencies, who is doing what or which is the last counterfeited product in China. This way we serve better our clients, in a virtuous cycle»

**Figure 1.** Firms in the ceramic districts of Castellón (Spain) and Sassuolo (Italy)




*Source:* Elaboration from Amadeus (Bureau Van Dijk), Boix (2009) and ISTAT (2006).

## 5. Conclusions

This paper is focus on understanding why multinational enterprises (MNEs) co-locate in industrial districts, stressing, unfolding and describing the potential of the local-level which permits MNEs to obtain additional sources of competitive advantage. Thus, this paper disentangles and clarifies how industrial districts have to be analyzed by MNEs in order to take advantage from the industrial districts resources in the co-location and off-shoring process. Thus, the paper expands the repository of decisions which may upgrade the MNE off-shoring process.

The paper has presented a real-life case study which permits reinforcing the theoretical propositions developed in the integration of both strands of the literature. It is empirically evidenced how the specific types of agglomerations found in each industrial districts and its agglomerations moderate the co-location decision by MNEs determining which specific activities better fit with the host location advantages in line with the general ideas of Jensen and Pedersen (2011), Rugman *et al.* (2011) and the specific facts of Nachum (2000). This idea has been pointed out when observing the differing off-shored activities in each industrial districts, depending on the specific sources of knowledge offered in each industrial districts, i.e. Castellón and Sassuolo. It is important to stress the fact that at the firm-level, the heterogeneity make also possible to consider the problem of adverse selection. In this case we want to refine what is known in the literature (e.g. Shaver and Flyer, 2000) about firm location decisions by specifically pointing out that these decisions are not at the firm-level but at the activity-level: firms can suffer from leakages in some activities and gains in others. Thus, the heterogeneity of activities and its fit to the local context is an interesting turf to be extended both theoretically and empirically. The net effect (gains vs spillovers) needs to be considered by MNEs, focusing only on offshoring those activities that better fit the local environment and lead to potential gains, while restricting those which are source of potential spillovers due to non-reciprocity by the local resources.

In addition, the different types of agglomerations are based on the different composition of architectural knowledge, i.e. context and its knowledge embedded, in each industrial districts, which determine the specific knowledge domain prevailing in each industrial districts and the opportunities for MNEs and more specifically the knowledge which can be tapped into by MNEs, as suggested by Tallman and Chacar (2011). Lastly, it is also recognized that the access to the diverse local resources by co-located MNE subsidiaries requires that the MNE subsidiary become integrated and inserted in the local networks, especially in order to access to local tacit knowledge, as remarked by Tallman and Chacar (2011).

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*Section* ARTICLES

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# An industrial district around a mining resource: the case of marble of Macael in Almería

José Á. Aznar-Sánchez *, Anselmo Carretero-Gómez *, Juan F. Velasco-Muñoz *

**ABSTRACT:** Marble quarries in Macael have been exploited since ancient times but its complex industrial district had to wait till the fifties to emerge. This industrial district includes extraction, processing and marketing activities. In the 1980s some development programmes were designed in order to modernize and boost the marble sector. Since then, it has become an international reference for ornamental stones. The sector has undergone a great transformation: from being a mining agglomeration to become an industrial district. This shift has provided the district with a great dynamism and resilience. Moreover, its competition position has considerably changed. It used to be based on comparative advantages but nowadays it is based on competitive advantages. In its heart a nodal enterprise Cosentino has emerged, which has become an international leader on a global scale.

**JEL Classification**: L72; R30; R58.

**Keywords:** marble, Almería, local development policy, industrial district, crisis.

## Un distrito industrial alrededor de un recurso minero: el caso del mármol de Macael en Almería

**RESUMEN:** Las canteras de mármol de Macael han sido explotadas desde la antigüedad, pero no es hasta mediados del siglo pasado cuando comienza a formarse un complejo industrial que engloba a la extracción, la transformación y la comercialización. En los años ochenta del siglo pasado se llevaron a cabo varios planes de desarrollo local para modernizar e impulsar este sector convirtiéndolo en un referente internacional en piedras ornamentales. El sector ha sufrido una gran transformación en su configuración pasando de ser una aglomeración minera a un distrito industrial, lo que le ha dotado de un gran dinamismo y resiliencia. También ha cambiado su posición competitiva que ha pasado de estar basada en ventajas

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comparativas a ventajas competitivas. Y en su interior ha surgido una empresa nodal (Cosentino) que se ha convertido en una multinacional líder a nivel mundial.

**Clasificación JEL**: L72; R30; R58.

**Palabras clave:** mármol; Almería; política de desarrollo local; distrito industrial, crisis.

## 1. Introduction

Almería has become a benchmark for the marble sector in Spain and internationally. According to the data from the Mining Statistics in 2013, 41 out of the 85 Spanish marble quarries were located in the province of Almería (48.2%), from which 921,609 tons were extracted (44% of the total marble in Spain). Furthermore, Almería is considered the most important marble reserve in Spain in both senses: quantity and quality. Most firms linked to the ornamental stone concentrate around the «Marble County» (Comarca del Mármol), a region which consists of five municipalities (Macael, Olula del Río, Fines, Cantoria and Purchena) and spreads on a 228 $km^2$ surface. Marble quarries in Macael have been exploited since ancient times but it was in the eighties when a radical change regarding its extraction, processing and marketing processes took place. It was then when the marble industrial district emerged and was characterised with a great dynamism and resilience.

The marble industrial district in Macael represents a completely new and relevant case study. Thus, when economic activities around mining are studied, only few researchers use the theoretical framework of industrial district. Alfred Marshall (1920) had already considered among the various origins of localized industries the existence of mines and quarries in the neighbourhood. Based on the approaches given by scholars devoted to the study of Italian industrial districts (Becattini, 2004), helpful analysing tools can be used in order to characterise our current case. We can consider the industrial district as a unit of analysis instead of the sector concept. Apart from those external economies already depicted by Marshall —contextual knowledge, auxiliary industries and services, and specialized labour market— further external economies can be studied like small firms dominance, the presence of an institutional and cultural environment embedded in a locality, and flexibility. Regarding the firm dimension, we do not have necessarily to focus on the analysis of small firms. It is crucial to study the added value generating chain, especially when elaboration and marketing strategies are incorporated to stone extraction processes. If we want to analyse the role of the supporting policies undertaken by the Administration it is unavoidable to take into account the access to nearly-public goods —training and infrastructure, among others. It is also attempted to search for the reasons explaining the district competitive advantages through the Competitiveness Diamond. The role played by the firms' strategies is also discussed. Schumpeter's contribution known as «creative response» helps extraordinarily understand the emergence of a multinational company within the district.

**Figure 1.** Marble County in Almería


Source: *enciclopedia.us.es* and own elaboration

Although we can find many studies on industrial districts around natural resources (mining), only few analyze the factors explaining its dynamics. However, it is necessary to give evidences which explain the disappearing of most industrial districts and the survival of a few, like the Marble case in Macael. The marble industrial district has a long history and for this reason the study of its dynamics is necessary and appropriate. This approach differs from the current general context where most research works analyse districts from a static point of view (Wang *et al.,* 2014).

We also integrate into the analysis entrepreneurial aspects. Firms' heterogeneity within a district is usually ignored but they show different abilities, objectives and strategies (Crespo, 2014). We consider necessary to introduce the analysis of firm strategies and capabilities in a district to understand its dynamics (Belussi and Sedita, 2009), especially if the research focuses on the different actuation lines followed by the firms in order to face up the crisis, as it is the case. Furthermore, exploring the emergence of a multinational company within the district enriches this recent research line (Sedita *et al.,* 2013).

This paper examines the configuration and dynamics followed by the marble industrial district in Macael. The paper is organised as follows. After this introduction, the coming section shows the long history trajectory of the marble quarries in Macael. The third section reviews the role of the Public Administration in the mod-

ernisation and fostering of the marble activities in the County, as well as in the configuration of the marble industrial district. The fourth section deals with the industrial district dynamics since the 1980s; main structure changes are then highlighted. In the fifth section, the crisis impact on the district and the strategies to exist the crisis implemented by the district firms are pointed out. Finally, the main conclusions of this study are drawn.

## 2. A long historical background

In the Macael County, marble extraction has been practiced for centuries due to the availability of a high quality resource in the region. But this activity has also been discontinuous along the years according to the needs at a given time. Marble from Macael has drawn builders' attention since ancient times but it was in the roman time when its use acquired a bigger prosperity. Arabs fostered the industrial activity from the 10th to the 15th century. Although the marble demand depends on the construction needs, its extraction has not ceased and it was used in monasteries, cathedrals and monuments during the 16th, 17th and 18th centuries (Carretero Gómez, 1997).

A decisive feature, which will play a relevant role in the future district configuration, is that marble quarries were «communal properties for all inhabitants». This is a key factor that explains the ancient fight of the Macael population to defend the quarries property against individual interests and Administration acts. It also explains its unique extraction system: first as a communal good and then as a good under municipal management. The particular system of land property and extraction licences made that marble extraction was concentrated in inhabitants' hands. However, Macael population had limited finance resources and were scarcely trained as entrepreneurs. Along the time many family owned enterprises were set up to exploit quarries with a low degree of mechanisation. Nevertheless, this fact was decisive to preserve quarries and avoid over-exploitation. These are the foundations for the marble industrial district based basically on small and medium enterprises.

Until the early 20th century, marble exploitation and elaboration was quite rudimentary. For instance, the 25 sawmills in the County only worked in winter. In this season they could profit from the waterfalls of the old mills to produce boards from the extracted marble blocks. The first lorries, which replaced old carts to transport marble in the site, were used in 1950; in 1955 petrol compressors were introduced in the quarries; and the saw electrification allowed in 1965 the use of a new generation of marble extraction machines.

Despite the above-mentioned improvements, the sector underwent a deep crisis in the eighties as a consequence of its important structure deficiencies. Regarding the extraction system, the old technified small quarries were not able to rationally extract the product so that the benefit percentage was reduced. Furthermore, the smallholdings under-used machinery, the work in the quarries was often hindered. All this meant higher exploitation costs. Regarding marble transformation, the poorly equipped firms were not able to produce a well-finished product. Their small dimen-

sions made not possible to cope with bigger jobs and firms could not collaborate in these cases since the product was not homogeneous. With a low quality product, they could not introduce an aggressive marketing campaign in foreign markets. As far marketing was concerned, it showed notable deficiencies. The buyers were forced to go to the Marble County in order to purchase the product. In many cases, the product was sold in rough or semi-processed. Hence most added values were lost (Carretero Gómez, 1995).

Even though so many deficiencies were present in the marble extraction, elaboration and marketing, an ever-growing number of enterprises agglomerated around the stone. In 1983 there were 241 firms which employed 1.708 workers. Most enterprises were small and medium ones (83% of the firms had under 11 employees) (Table 1).

**Table 1.** Firms classification in the Marble County according to activity and size in 1983

| *Activity* | *Extraction* | | *Extraction with workshop* | | *Transformation* | | *Crafts* | | *By-products* | | *Services* | | *Total* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Size (workers)* | *N.* | *workers* | *N.* | *workers* | *N.* | *workers* | *N.* | *workers* | *N.* | *workers* | *N.* | *workers* | *N.* | *workers* |
| 1 to 5 | 31 | 87 | 9 | 39 | 45 | 145 | 32 | 122 | 5 | 22 | 38 | 81 | 160 | 496 |
| 6 to 10 | 5 | 40 | 13 | 110 | 9 | 68 | 5 | 32 | 3 | 27 | 5 | 35 | 40 | 312 |
| 11 to 15 | 2 | 24 | 10 | 138 | 3 | 44 | 1 | 12 | 1 | 12 | 1 | 12 | 18 | 242 |
| 16 to 20 | — | — | 1 | 20 | 2 | 37 | 1 | 18 | — | — | 1 | 17 | 5 | 92 |
| 21 to 30 | — | — | 7 | 173 | 1 | 9 | — | — | — | — | — | — | 8 | 182 |
| 31 to 40 | 1 | 33 | 4 | 143 | — | — | — | — | — | — | 1 | 35 | 6 | 211 |
| Over 40 | — | — | 3 | 127 | 1 | 46 | — | — | — | — | — | — | 4 | 173 |
| Total | 39 | 184 | 47 | 750 | 61 | 349 | 39 | 184 | 9 | 61 | 46 | 180 | 241 | 1.708 |

Source: Asociación de Empresarios del Mármol de Almería (1984) and own compilation.

## 3. Public Administration Stimulus

The implementation of the *Global Actuation Plan for the Marble Region of Macael* in 1983 supposed an inflection point for the sector evolution which was undergoing a very critical situation at that time. The Plan was promoted at its beginnings by the IPIA (Instituto de Promoción Industrial de Andalucía - Institute for Industrial Promotion in Andalusia) and during its implementation (1983-1992) many old problems, dragging the sector, were solved and new approaches for the difficult situation were proposed (Barzelay and O'Kean, 1989). Hence the new industrial structure fostered by this Plan led to a mechanization improvement of the quarries and elaboration factories, bigger marble blocks could be extracted and a higher quality in the final product was achieved. Regarding extraction, the main programme contribution

was the division of the quarry field in «units of exploitation» made up of several quarries with similar features. Thanks to this measure, technical equipment could be used rationally, continuity in marble supply was assured and a higher security in the exploitations was introduced. Such improvements played an essential role in the reduction of extraction costs, increase of the reservoir life and productivity. In the product transformation phase, the new industrial structure served as foundations to rationalise the activity, resize firms and update technologies. Many non-competitive small firms devoted to construction materials shifted to the craftsmanship sector. A further major contribution of the Plan was its capacity to agglutinate all involved agents, wills were brought together to overcome obstacles and reach joint goals (Barzelay, 1991).

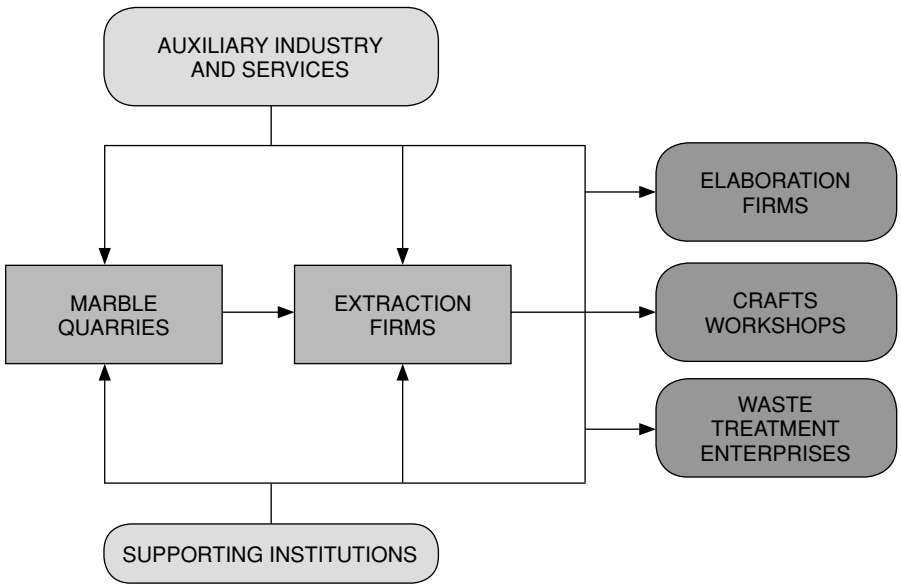
Later on, with the aim of fostering the sector after the economic recession during the early nineties, the APEM (Businessmen Association of Marble in Almería) introduced in 1996 the *Strategic Plan for Macael*, under the frame of *Integrated Actions to Promote Local Productive Systems* launched by the IFA (Instituto de Fomento de Andalucía), the regional development agency of Andalusia government. The previous boosting initiatives in some sectors and territories were to be revitalised. The Plan aimed at reforming the County into «an international workshop for the research, applied arts and supply of the natural stone»; at the same time, it pursued the competitiveness improvement of the enterprise tissue in order to position it at the top range of national and international markets (Carretero Gómez, 2004).

The Strategic Plan brought its predecessor Actuation Plan a step further and assured continuity. The latter had an integration character and had consequences on the entire sector: infrastructure, firm equipment, productive efficiency, quality, product design and development, internal articulation of the production tissue, marketing, training, etc. Moreover, as the previous Plan, it was implemented in a favourable economic period (1996-2000). Thanks to the measures introduced by the Strategic Plan and its goal of making the County an elaboration centre, the sector took a huge step forward in introducing added value to the regional product and to other products exported from different national and international quarries. In addition, the complete technical dependency of the 1980s was overcome and the region started to produce technologies which met local needs. The by-products firms were strengthened up and helped reduce the environmental impact of the extraction activities. A huge effort to diversify markets was undertaken and it was expected to improve sales in international markets, which only represented a 10% at that time (Carretero Gómez and Aznar Sánchez, 2012).

A further decisive event in Macael, in 2002, was the inauguration of the *Centro Tecnológico Andaluz de la Piedra,* (Andalusia Technology Centre for Stone). It was set up to boost quality, promote research and development projects, offer entrepreneurs quick information about activities related to the natural stone and enable the technology transfer among the sector enterprises. It also promotes firm cooperation, market analysis and studies (Carretero Gómez, 2004). In 2006 the *Fundación Marca Macael* (Foundation Marca Macael) was grounded as a platform for marketing campaigns of the brandname «Marbles from Macael» and natural stones.

Even though many features of an industrial district were already present previous to the Public intervention (proximity, identification between community and enterprises, social relationships, etc.), there is no doubt that the Administration Action contributed to the agglomeration of firms linked to marble extraction, elaboration and marketing. It can be considered that this agglomeration became an industrial district after such interventions. The marble industrial district of Macael already appeared in the map of the Spanish industrial districts of 2001 elaborated by Boix and Galletto (2006). The central core of the marble industrial district integrates activities linked to extraction and product transformation (elaboration firms, crafts workshops and waste treatment enterprises). Around this core, a great variety of enterprises and auxiliary industries is to be found, as well as institutions devoted to its development (Figure 2).

**Figure 2.** The marble industrial district in Macael




Source: Personal compilation.

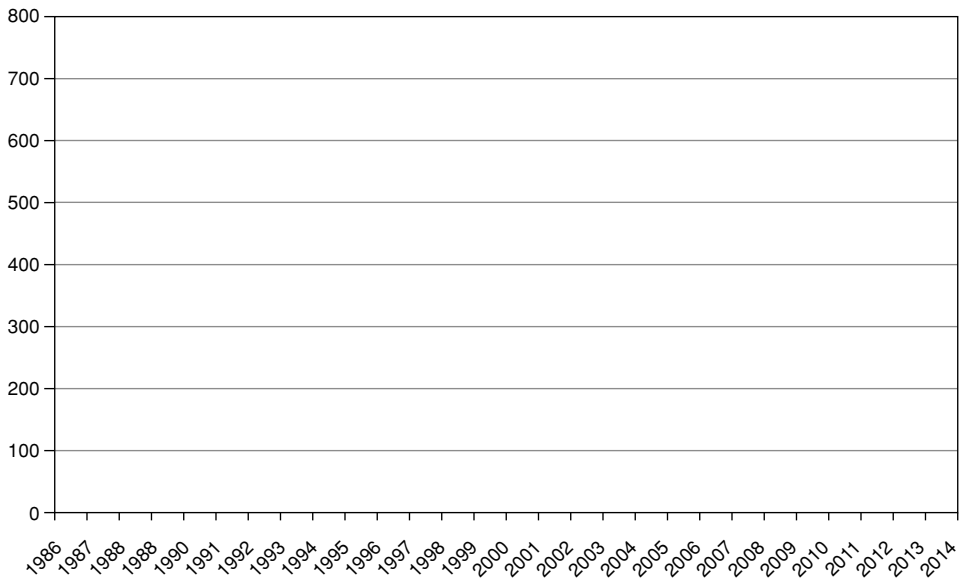
The industrial district is mainly made up of family owned small enterprises, constituted as limited liability companies. However, the district has acquired along the time a higher level of diversification and complexity. Extraction activities have a lower weight compared to elaboration and transformation ones. In the elaboration process, the contribution of crafts firms stands out since they generate a great added value. Furthermore, industrial craftsmanship has become more important than the traditional ones. This trend has provoked a higher level of technification and the employment of highly qualified workers. All this generates a relevant competitive advantage. In the last years, new enterprises devoted to waste treatment have emerged,

as well as marble by-products processing firms which obtain crushed, micronized materials and lime. Among the enterprises and industries providing auxiliary services, some of them are specialised on the manufacturing of machinery for marble extraction and elaboration or on the supply of compressed air to the quarries. Other enterprises belong to different industrial sectors but have adapted themselves to the marble district needs and particularities: industrial cleaning of sewage from marble cutting, reparation of machines and industrial vehicles, packages, supplies for productive firms, computing and communication, consultancy, etc. Institutions supporting the development of the district activities are very heterogeneous and work on different fields: assuring sector interests (Businessmen Association of Marble in Andalusia), promoting training and research (Andalusia Technology Center for Stone and Andalusia Marble Scholl), dissemination of product expertise (Foundation Marca Macael), etc.

## 4. Industrial District Dynamics

Since the Public intervention stimulus took place within the marble industrial district in Macael, this began to experience continuous positive dynamics till the crisis in 2008 (Figure 3). In 1993 sales accounted for 96 million euros and in 2005 they increased up to its maximum, 761 million. In 1994 there were 3.200 employees and the cipher grew up to 5.959 workers in 2007, reaching its maximum.

**Figure 3.** Evolution of annual sales of the marble sector in Almería (in million euros)




Source: Asociación de Empresarios del Mármol de Andalucía (several years).

Besides this notable quantitative increase, deep qualitative changes took also place with a considerable new configuration of the industrial district. The most important step forward was to become an elaboration centre where almost all extracted marble was processed, as well as other blocks coming from foreign quarries. Formerly only a small proportion of the extracted marble was transformed in Almería. Thanks to this qualitative change, the district acquired almost the entire added value from the extracted stones in Almería and began to provide added value to stones coming from external quarries. This practice originated a significant increase of the importation of marble blocks: in 1998 importations accounted for 4.368 tons and in 2007, 58.641 tons. They come mainly from Turkey, followed with considerable distance by Italy and Portugal; further origins are Egypt and Iran (Carretero Gómez and Aznar Sánchez, 2012). This transformation was essential for the industrial district dynamics since the reservoir life has been extended and, at the same time, the dependency on local stone has been reduced. It has proved to be an important competitive advantage based on the availability of highly qualified and specialised workforce.

A further crucial event in the district dynamics was the evolution of the family owned enterprise Cosentino into a multinational company. The family Cosentino began to work with marble in the forties, the firm was mainly focused on the quarry exploitation and the elaboration of basic marbles. The second generation grounded in 1979 the enterprise called «Mármoles Cosentino, S.A.» with 17 employees at its beginnings. At first, the history of this enterprise is similar to the one of many others in the County. However, the brothers Martínez-Cosentino became aware that if they wanted to increase its business volume, their activities should go beyond mere local marble extraction and transformation. They considered very risky to depend on a unique local natural resource and address sales only to the Spanish construction sector, which was and is very instable (Martínez-Cosentino, 2010). Taking into account all these aspects, they decided to launch a strategy of differentiation and international expansion based on research and innovation.

Under this context, the enterprise addressed its efforts during the eighties to the search for new material and market segments. As a consequence of these guidelines, in 1986 a new product known as «Marmolstone» was launched to the market. Nevertheless, the many quality problems made the project fail. The enterprise was about to disappear. However, research activities did not cease and in 1990 Cosentino developed a new product called «Silestone». The new produced material brought together in a unique surface the best features of a natural stone with outstanding physic and mechanic characteristics completely new in the market. Moreover, the enterprise focused on new market niches apart from the traditional ones: its specific application as kitchen worktop. The strategy proved to be a real success and placed the enterprise as the international leader in this market segment.

Constancy in research and innovation has allowed the enterprise to develop new materials which have become international references within their markets. In order to face up the competition of manufacturers from other countries who offer similar products but at lower prices, in 2004 the «antibacterial Silestone» was put on the market with relevant differentiating improvements. With this innovation, Cosentino

placed into the market the unique quartz surface with antibacterial protection. This surface was the most secure and hygienic within the kitchen worktop market. Furthermore, this surface could be introduced in such exclusive segments as hotels and catering establishments, hospitals and laboratories.

The second driver for growth was the willingness to acquire international presence. The creation of Silestone led the enterprise to a regular exporting activity to several markets and the company step into internationalisation. The availability of a differentiated product with the highest quality level and a secure service were the foundations for the internationalisation process. At the early nineties, the enterprise started to sign up exclusivity agreements with suppliers to introduce Silestone in several markets (United States, Canada, Israel, Italy, Belgium, South Korea, Singapore, etc.).

In 1997 a determining step for the enterprise internationalisation was taken: the constitution of a subsidiary company in the United States with a local partner. Cosentino was in charge of manufacturing the quartz surfaces, whereas its local partner was responsible for the exclusive distribution of Consentino products in the United States, Canada, Mexico and Puerto Rico. This subsidiary company opened up the distribution channels to the most important kitchen market in the United States, controlled by two big chains (Home Depot y Lowe's). Cosentino made a great inversion in promotion and publicity to generate a brandname image among end clients. The Silestone kitchen worktop experienced a huge success and sales increased dramatically (Martínez Mendiara, 2012). In 2010 Cosentino acquired the whole share capital and the full incorporation of the subsidiary company into the Group structure took place.

From this experience on, Cosentino followed the same patterns in its internationalisation process. It established trading contacts with the desired markets through the participation at specialised international trade fairs and signed exclusive distribution agreements with local partners. When regularity of sales in those markets was reached, a trading subsidiary company was grounded and headed by an expert in the specific market. Cosentino offered shares to its local partners but it always kept over 50% of the company shares with the aim at implementing its control policy over distribution. If business volume increases enough, production centres and transformation workshops are set up in those countries. Cosentino offers there its knowhow and designs training plans for employees. Regarding management and marketing, the subsidiary company is quite autonomous but positive results are always required (Llano Irusta, 2008). This flexible model of trading organization enables a quick and systematic adaptation to the continuous market changes and to its particularities. Within each market, the preferred products and the distribution channels may vary greatly. Following this concept, Cosentino increased its trading infrastructure. Nowadays it controls over seventy suppliers all over the world and owns 15 subsidiary companies (Aznar Sánchez, Carretero Gómez and Velasco Muñoz, 2015).

Its differentiation and internationalization strategy was a success from its beginnings. Since 1990, Cosentino grew uninterruptedly. Sales have dramatically increased: in 1990 they accounted for 10 million euros and in 2000, 70 million; in

2010, 305 million and in 2014, 560 million euros. The number of employees has also increased from 200 in 1990; to 630 in 2000; 1.950 in 2010 and 2.645 employees in 2014. This dynamic has made Consentino gain relevance within the marble industrial district; it has become the leader and nodal company within the industrial district. Ciphers are overwhelming; in 2013 its exploitation income and number of employees represented over the 90% of the district firms (table 2).

**Table 2.** Ranking of enterprises linked to ornamental stones in the Marble County (2013)

| *Enterprise* | *Exploitation incomes (thousand euros)* | *Employees* |
|---|---|---|
| Cosentino | 267.817 | 1.145 |
| Cuellar Arquitectura de Mármol | 6.032 | 40 |
| Mármoles Camar | 2.113 | 29 |
| Mármoles Cosaga | 1.402 | 22 |
| Artesanos del Mármol | 824 | 20 |
| Mármoles Naturales Macael | 483 | 15 |
| Mármoles Arriaga Cruz | 809 | 14 |
| Carmona Mármoles | 551 | 14 |
| Antonio Carmona | 308 | 14 |
| Mármoles la Viña | 1.230 | 12 |
| Mármoles Pérez García | 733 | 12 |
| Mármoles Antonio el de Pura | 3.501 | 10 |
| Mármoles Sotomar | 781 | 10 |
| Rest (36 enterprises) | 8.075 | 110 |
| Total | 294.659 | 1.467 |

Source: SABI. Data from enterprises with information at the database in 2013.

## 5. Crisis-response strategies of the industrial district

The deep international economic crisis and the falling of domestic demand due to the decline of the Spanish construction sector in 2008 provoked the most important regression of the marble industrial district in recent times. Between 2005 and 2011, sales decreased 44.2%, ciphers went from 761.2 to 425.1 million euros. Impact on employment was also notable, between 2007 and 2012 the direct employed-district workforce was reduced to 50%, from 5,959 to 2,941 employees respectively. The number of enterprises have been drastically reduced to almost its 50%, in 2007 there were 307 and in 2014, 168. The crisis has directly impacted on extraction firms and

on those small and medium enterprises which supplied domestic market. Over 60% of them have disappeared due to lack of productive efficiency and financial capacity to face up non-payments and debts (Escuela del Mármol de Andalucía, 2013).

The district enterprises are following different actuation lines to face up this situation. The actions taken on the marble extraction and elaboration field have started to improve their operative efficiency. The productive technology has been optimised in order to offer a quick service of high quality. Cost control has also been strengthened up. A further actuation line has been the diversification and empowerment of auxiliary production (industrial craftsmanship, stone crushing and micronized minerals), it has been re-oriented to new market niches. A new product differentiation strategy has been launched, as well as the specialisation on high quality exclusive products. These new products have a considerable added value and are directed to design and decoration businesses. Hence, promotion campaigns addressed to architects and designers have been carried out since they can prescribe the product use. The participation at trading specialised fairs has been reinforced, as well as inverse trading missions. A new strategy based on the brandname «Mármol Blanco de Macael» (White Marble from Macael) has been programmed. The district also aims at achieving the designation of origin of the raw material (Escuela del Mármol de Andalucía, 2013).

The main strategy to increase sales and balance the decline of domestic demand has been a strong internationalization process. The most frequent and successful formula is the search for a local dealer in the target market. A contract of exclusivity is signed up to assure the distribution of products from the district enterprises. In other cases, the followed formula is the implantation of a trading agent in the target country (Analistas Económicos de Andalucía, 2013). A further successful strategy in international markets is offering an integral service, which goes beyond the mere product sale. In order to meet such requirements, new consortia have been set up to offer a turnkey service to end clients. It includes assessment, manufacturing, elaboration, installation and the after sale customer service.

The internationalization strategy of the district has been very successful. In 2005 exports accounted for 137.9 million euros, and in 2014 they increased up to 303.4, its historical maximum. Sales on foreign markets went from 18.1% of total sales in 2005 to 53.1% in 2014. A market diversification has also been experienced. In 2009 the main client was the United States but in last years it is Russia. Other countries like Germany, Brazil and Saudi Arabia are becoming also relevant clients of the district (Analistas Económicos de Andalucía, 2013).

Enterprise cooperation should be underlined as a qualitative aspect in this internationalisation strategy. In the district there was already a widespread cooperation culture, very successful in the fields of supplies and by-product treatment. Currently, cooperation is taking place through small and medium enterprises' alliances in order to meet certain project requirements, subcontract other enterprises, meet certain product demands or produce some parts. These cooperation relationships require a clearer division of work and enable specialisation, so that subcontracting enterprises

can improve their competitiveness and productivity. Moreover, they can cope with big projects and place themselves at international markets (Aznar Sánchez, Carretero Gómez y Velasco Muñoz, 2015).

A further feature to be mentioned regarding district dynamics is the emergence of several driving enterprises with outstanding leadership skills. On the one hand, we can find medium productive enterprises devoted to marble elaboration, which have obtained a relevant advantage thanks to its distribution channel. Most of them own quarries, many of which are also abroad, so that they can purchase raw material at a good price and considerable supply availability. They have a strong production capacity, a sophisticated production system, an outstanding logistic capacity and own stores in different regions. They are developing a brandname policy together with important communication strategies. On the other hand, we can find the group of exporting craftsmanship made up by enterprises which followed a product differentiation strategy and reached new market niches. They produce mainly industrial crafts from stone. Some of these enterprises carry out integral projects. They combine crafts and industrially elaborated products and they usually outsource the manufacturing of processed material. These driving enterprises have experienced a great development in a short period of time and they are already over ten (Agencia de Innovación y Desarrollo de Andalucía, 2014). The evolution of these driving enterprises will be decisive for the district future due to their relevant dragging effects and internal dynamization.

During the crisis Cosentino has kept a positive evolution. Between 2005 and 2010 sales increased 55%, they went from 170 to 305 million. Regarding employment, it also increased its cipher 35%, from 980 to 1,950 employees respectively. This positive behaviour in a general context of crisis is the result of its constant strategy of innovation and internationalization. The Group continued to introduce new materials to its product portfolio (Eco, Sensa, Prexury, etc.) but the most valuable is the one known as «Dekton». Its launching into the market took place in 2013 and the company invested 128 million euros in its production. Dekton is an innovative ultra-compact surface with better technical behaviour than Silestone. It is made up of inorganic raw materials. Its features make it a suitable material to revolutionise the international architecture and decoration world, the new market segment on which Cosentino focuses. In fact, Dekton has allowed the Group to increase its activity in the architecture and design field, as well as strengthen its position in fields like facades and outdoor applications. Dekton is the third Consentino product in terms of turnover.

In 2008 a shift in the internationalisation policy took place. The company was aware that to capture markets and create the highest added value possible, it had to participate in the last chain link as well. It has to reach the final consumer (Martínez-Cosentino, 2008). For this purpose, it developed a new trading model based on its stores which were labelled «Cosentino Centres». They were no longer mere storage places for marble-workers, they started to be the place where new clients (architects, designers, kitchen and bathroom furniture sellers, installers, etc.) gathered. These Centres founded an integrated organization unit for delivery, exhi-

bition and sales. They were responsible for the market development and service of a territory. This model presents some advantages. The costs of the value chain were reduced since scale economies were achieved thanks to the existing material distribution and promotion channel. Moreover, a better service is offered to its users and real needs of the market can be better understood (Martínez Mendiara, 2012). The Centres act also as training and updating institutions for different collectives. Such business model has worked really well and the company started to widespread its Centres. It has nowadays 94 Centres around the world. In 2013 the Group took a step forward with the creation of the so-called «Cosentino City». An exhibition site located in the town centre of big cities like Sydney, Singapore or New York. They have been specially designed to welcome architects and designers.

The differentiation and internationalization strategy followed by Cosentino during last years has also been very successful. Currently, Cosentino Group is the international leader in quartz surfaces and the biggest enterprise in the sector of ornamental stones. It has seven manufacturing sites (six in Spain —Almería— and one in Brazil), 15 bathroom and kitchen worktop elaboration sites (14 in The United States and one in Almería), an intelligent logistic platform in Spain, two dealing hubs in USA and over 90 Cosentino Centres all over the world. Over 90% of the Group turnover comes from abroad —560 million euros in 2014—. The Group owns subsidiary companies in 15 countries (USA, Holland, Belgium, Austria, Ireland, United Kingdom, Germany, Sweden, Portugal, Italy, Switzerland, France, Brazil, Mexico and Australia) and work directly with employees, producing and trading agents in 29 countries of the five continents. It sells products in over eighty countries.

It should be highlighted that even though it is now a multination company, headquarters are still located in the district, where the industrial Park is to be found, as well as its production, administration and logistic centre from which the whole international trading system is monitored. The main following manufacturing sites are located in the district: the three manufacturing plans for Silestone and Eco by Silestone, one for Cosentino marbles, a modern manufacturing centre of kitchen worktops and a producing plant for special materials and the generation of physical samples. The new manufacturing plant of Dekton and the intelligent logistic platform are also located in the district.

## 6. Conclusions

Marble quarries in Macael have been exploited since ancient times and are still active. One of the key reasons that explain the continuity of this economic activity is that quarries were communal properties until the 19th century, when they started to be considered own properties under municipal management. This feature made the district to be based on small family owned firms from its origins. A recent key factor, that has contributed to foster district activities, has been the configuration of a marble industrial district embracing marble extraction, elaboration and trading.

In the 1980s the stimulus given by the Public Administration was decisive to implement some local development actions which improved the activity competitiveness and brought the district into a growing phase. Moreover, some of the development measures contributed to a shift in its competitive position: from being based on comparative advantages (availability of an unique natural resource) to competitive advantages (research and innovation, qualified and specialised workforce, trading channels, marketing, etc.). The shift from extraction activities to a transformation place of own and foreign raw materials let the district reduce its dependency on local raw material and increase added value.

Furthermore, Public intervention allowed the evolution from a mining agglomeration to an industrial district with great dynamism and resilience. And when the crisis in 2008 hit the sector, it could be faced up thanks to several response strategies, many of which are based on enterprise cooperation. A further outstanding fact within the district has been the adopted differentiation and internationalisation strategy based on research and innovation. They were carried out in the eighties by the Cosentino company, an international leader within the natural stone sector. Hence Cosentino has gained relevance within the marble industrial district in Macael and has become the driving company within it.

Two key aspects impacted decisively on the configuration of the industrial district. On the one hand, Cosentino's behaviour within the district. The enterprise's aim at keeping its main activities and its headquarters in the district territory had a very positive connotation. Furthermore, this company supports and collaborates with other district firms, especially financing some activities and in the trading field. It participates at educational and socio-cultural projects, funds grants, etc. Nevertheless, externalities of the industrial district have been seriously affected by the presence of this leader and nodal company (expertise transfer, availability of highly qualified workforce, suppliers' presence, etc.). It is also interesting to underline that small and medium size enterprises are dynamising the district, some of them have become driving enterprises and contribute to the industrial district renewal and resilience.

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*Section* ARTICLES

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# *In vino veritas:* competitive factors in wine-producing industrial districts

María Jesús Ruiz Fuensanta*, Francesc Hernández Sancho**, Vicent Soler i Marco***

**ABSTRACT:** The wine sector holds a prominent place within the whole Spanish food and agriculture industry. The importance given to this activity has also been transferred to the international market where Spain holds a position of leadership, both in terms of production as in overseas sales. A large number of the wine-producing firms in our country are located in industrial districts, which is to say in geographical areas characterised by a high concentration of small and medium-sized companies whose productive organisation corresponds to a model based on flexible specialisation. In previous papers, it has been possible to verify how wine-producing industries located in industrial areas show greater efficiency in relation to rivals located in other types of environments. The aim of this article is to further research on the specific features of industrial districts which could explain their firms' increase in efficiency. For the identification and quantification of these determining factors affecting productive efficiency, a methodology based on parametric adjustments models is to be used. An empirical application is to be carried out on a sample of Spanish wine producers for the years 2000 and 2010, extracted from the SABI database.

**JEL Classification**: D20; L66; R10

**Keywords:** Industrial districts; Productive efficiency; wine sector.

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## *In vino veritas:* factores competitivos en distritos industriales productores de vino

**RESUMEN:** El sector vitivinícola ocupa una destacada posición en el conjunto de la industria agroalimentaria española. La importancia demostrada por esta actividad se traslada también al mercado internacional donde España ostenta una posición de liderazgo tanto en términos de producción, como de ventas al exterior. Buena parte de las empresas elaboradoras de vino de nuestro país se ubican en distritos industriales, o lo que es lo mismo, en entornos geográficos caracterizados por la elevada concentración de pequeñas y medianas empresas cuya organización productiva responde a un esquema basado en la especialización flexible. En anteriores trabajos, se ha podido constatar cómo las empresas elaboradoras de vino ubicadas en este tipo de enclaves industriales presentan una mayor eficiencia respecto de competidores localizados en otro tipo de entornos. El objetivo de este artículo es profundizar en la investigación de los rasgos específicos de los distritos industriales que podrían explicar este plus de eficiencia de sus empresas. Para la identificación y cuantificación de estos factores determinantes de la eficiencia productiva se utiliza una metodología basada en modelos de ajuste paramétrico. Se lleva a cabo una aplicación empírica sobre una muestra de empresas españolas productoras de vino para los años 2000 y 2010, extraída de la base de datos SABI.

**Clasificación JEL:** D20; L66; R10.

**Palabras clave:** distritos industriales; eficiencia productiva; sector del vino.

## 1. Introduction

The food and agriculture industry has always formed, and still forms today, a prominent part of the Spanish production structure. Within this, one of the most relevant activities is wine-making. This is not without reason, according to data from the International Organisation of Vine and Wine (OIV), Spain is the country with the greatest expanse of vineyards in the world, with 945,727 hectares allocated to vine cultivation in 2013, despite having experienced a progressive decrease in the cultivated area since 2004. This area is distributed throughout the seventeen autonomous communities, although this is not uniform. The region of Castilla-La Mancha stands out in particular, as it accumulates 49% of the total national area, and has thus become the geographical area with the largest area allocated to this type of cultivation in the world.

In line with the above, Spain is also ranked among the top positions in international wine production. Specifically, according to data published by the Spanish Agricultural Guarantee Fund (Fondo Español de Garantía Agraria, FEGA) our country became the first wine producer in the world for the first time in 2013, with a combined production of wine and must of 52.6 million hectolitres, representing an increase of 53.7% in relation to that obtained during the 2012/2103 season, compared with Italy's 44.9 million and France's 42.3 million. Moreover, the majority

of national production is set aside for export, making this sector a valuable positive contribution to the balance of our balance of trade. In fact, according to information provided by the Institute of Foreign Trade (Instituto de Comercio Exterior, ICEX) Spain was the second country in terms of the number of litres of wine exported during 2013. However, when considering the value of exports, Spain was relegated to third position behind France and Italy. This figure indicates the low average selling price of Spanish wine, despite the fact that in that year there was a simultaneous decrease in the volume of wine exported and an increase in the value of exports, showing the increase in the price per litre of wine sold on the international market. It is not for nothing, the sales of wine with protected designations of origin that year experienced an increase in exports, both in volume and value.

The production of wine in our country is elaborated in the 4600 wineries (according to data from the Spanish Institute for Foreign Trade (Instituto Español de Comercio Exterior, ICEX) which are distributed throughout the national territory. It is a sector in which there is generally a predominance of small, family-owned companies and where a strong presence of the phenomenon of cooperativism can also be detected.

Due to all the above, the wine industry is not only important in terms of GVA and national employment, but it also plays a strategic role in local development. It is a manufacturing activity that is rooted in the tradition and culture of many territories, where it sometimes constitutes the local community's main source of income, in a direct way through the cultivation of the vine and its transformation into wine, and indirectly though the emergence of auxiliary industries and complementary services, such as the growing rise of Enotourism.

This paper aims to investigate the factors that influence the productive efficiency of Spanish firms dedicated to the production of wine related products. To do this, we will start with technical efficiency indexes taken from a previous paper (Hernández *et al.,* 2013) by means of the application of nonparametric methods on a sample of Spanish wineries. In that paper, the carrying out of a series of preliminary tests on the indices calculated indicated the existence of differences in efficiency based on whether or not the winery was located in an industrial district. For this reason, the aim of the present paper is to further the study of such divergences, trying to identify the specific aspects that could explain the differences in efficient performance between firms, and whether this identification allows the influence of the «district-effect» (Hernandez and Soler, 2003).

In the following section, we will precisely explore the determinants of business efficiency in greater depth, placing special emphasis on the influence of territorial externalities and their connection with the efficient performance of wine firms. In the third section, the model used for the empirical analysis is presented, while in the fourth part a description of the variables and the sample used in the estimation is given. The empirical approach and the results of the estimation are described in the fifth and sixth sections respectively. Finally, some brief conclusions are presented.

## 2. Territorial externalities in the wine sector

Closely related to agriculture, the origin of the wine industry goes so far back in time that today it is deeply rooted in the territory in which it is developed, in a way that a great part of the socioeconomic life of that territory revolves around it. In those days, it was often the vine growers themselves who started to carry out the first transformation of grapes taken from their crops and, sometimes, also from other neighbouring farmers. However, there were also those who only worked in the elaboration process, buying the raw material from farmers in the area. There were even certain villages in which the inhabitants produced the wine together, later sharing the wine obtained according to the volume of grapes brought by each person (Pan-Montojo, 2001). In this custom, the origin of two of the features of the current wine industry can be seen with a clear influence on the efficiency of firms in the sector: the emergence of horizontal organisation for production activity, and cooperation for carrying out certain activities.

In connection with the first of these features, it should be mentioned that the progressive development of the wine industry in a specific territory generally leads to the proliferation of companies belonging to auxiliary industries and production services, resulting in the formation of authentic agro-industrial districts.

According to the classical definition, the Marshallian industrial district is a «socio-territorial 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» (Becattini, 1990). The express mention made in this definition of the social community that lives in the district precisely underlines the fact that the Marshallian industrial district is something more than a simple business cluster based on the existence of locational advantages. The Marshallian industrial district enjoys the mark that is left by the historical development of a manufacturing activity which has become the centre of the local productive environment, and, by extension, is also the epicentre of the area's social progression. Specifically, the industrial district is characterised by gathering a significant number of small and medium-sized companies within its territorial limits which specialise in one or several of the phases into which the productive process of the activity which makes up the district's main industry can be separated (Dei Ottati, 2003; Sforzi, 2003).

By extension, according to Iacoponi (1990), the agro-industrial district would be that in which the production activity developed in the local environment contains all the phases of agribusiness; therefore including the suppliers of agriculture companies, the companies themselves and also the companies engaged in the transformation and distribution of products from agriculture.

This particular way of organising the production activity and the cooperative and competitive relationships which are initiated between the economic agents residing in the district are the origin of some competitive advantages that can only be enjoyed by companies located within the district and which logically have become superior performers in relation to companies located outside of it. In particular, the socio-ter-

ritorial support of the population of local companies allows solid bonds of trust to be generated, which favour the formal and informal diffusion of knowledge (Sengenberger and Pyke, 1992; Bellandi, 1996; Hernandez *et al.,* 2012).

In addition to the historical development itself, over the last few years, the management derived from the Designations of Origen has contributed to strengthening wine firms' connection to the territory, due to the obligation to use raw materials of a given origin and carry out certain phases of the production process in the specific geographical area (Sánchez, 2003).

Due to this strong link between the territory and wine firms, it is foreseeable that the characteristics and circumstances of the local environment in which these firms develop their activity have a significant influence on the performance of the firm and, in particular, on its productive efficiency (Hernández and Soler, 2003, 2008; Vidal *et al.,* 2013; Aparicio *et al.,* 2015). Other authors, (Capello, 2009; Fusco and Vidoli, 2013) points out that the territories are a source of economic advantages or disadvantages, which range from the mere availability of productive factors to the existence of raw materials and whether the area can be more or less easily accessed. Of equal importance, especially in the case of industrial districts, are the externalities of knowledge and opportunities for learning which may arise in the local productive environment as a result of the formal and informal relationships that are initiated between the agents that live and work within it (Sorensen, 2002). Tacit knowledge derived from the specific nature of each geographical environment and local practices is especially relevant for the performance of modern wine production (Turner, 2010; Outreville, 2015).

All these territorial characteristics join the features of the firms to determine their productive efficiency. In this sense, it is important to note that the wine sector has not stayed on the sidelines of the process of innovation and technological modernisation that Spanish industry has experienced during the last few decades. In this way, they have incorporated process and product improvements, such as the use of remote sensing in the regulation of soil characteristics or the use of yeasts selected, and on occasions genetically improved, during the fermentation process of the wine. These advances undoubtedly contribute to improving the efficiency of wineries, although incorporating them into their production processes is inevitably determined by the availability of financial and human resources. Ultimately, physical capital intensity can be considered to be an approximation of the specific knowledge of the activity developed by the firm, which is found to be incorporated into the machinery and equipment used in the production process (Wu *et al.,* 2007).

Furthermore, innovation in the wine sector is transferred not only to the manufacturing process and variety of products, but also to the way of organising and managing the activity (Cusmano *et al.,* 2010; Castillo-Valero *et al.,* 2013; Simon-Elorz *et al.,* 2015).

In this paper, we aim to precisely analyse the influence that a selection of factors from the firm and environment have on Spanish wineries. The description of the model used for this is made in the following section.

## 3. Description of the model

Among the strategic objectives of any firm, is clearly the one which concerns the progressive improvement of the firm's productive efficiency until it is able to position itself, at a given time, on the line establishing the production boundary. Nevertheless, there are factors such as technological rigidities, inertia, resource constraints and institutional regulations and controls that will make it difficult for the firm to immediately reach its full efficiency (Gujarati, 1995). Therefore, change in the real value of a firm's technical efficiency in a certain period will not be total, but rather partially adjusted to the desired value. For this reason, the suggested equation takes the form of a partial adjustment model:

$$TE_{i,t} - TE_{i,t-1} = \delta_i (TE^*_{i,t} - TE_{i,t-1}) \tag{1}$$

in which $TE_{it}$ is the observed value of technical efficiency [1] for firm $i$ in the period $t$, $TE_{it-1}$ is the value for the previous period, $TE^*_{it}$ is the desired value (target) for efficiency and $\delta_i$ is the speed of adjustment. This last value represents the rate of convergence of the firm's real efficiency to its desired value and its value should fall between 0 and 1. The extreme case in which the speed of adjustment is zero means that real efficiency in the period $t$ is equal to the efficiency obtained in the previous period ($t$-$1$). The opposite extreme in which the speed of adjustment is equal to one means that real efficiency in the period t has completely met the desired value. Consequently, if it is observed that $\delta_i < 1$ then there is a partial adjustment between the degree of technical efficiency from the period $t - 1$ to the period t. However, if $\delta_i > 1$ then there is an over-adjustment in the target value of technical efficiency. This over-adjustment can be a reflection of unforeseen changes in the economic conditions (Lööf, 2004).

Equation (1) can be reformulated in the following way:

$$TE_{i,t} = \delta_i TE^*_{i,t} + (1-\delta) TE_{i,t-1} \tag{2}$$

[1] From a productive point of view, the term efficiency is associated with a rational use of available resources. It is used to describe production processes that employ all production factors optimally in accordance with the existing technology. Farrell (1957) became a pioneer in the study of the frontier functions used as referents to obtain measures of efficiency for each unit of production. This method of analysis represents the origin of what is known in the economic literature as Data Envelopment Analysis (DEA) models. According that, a frontier of best practices is made up of the most efficient firms in the sample and obtained by using linear programming techniques. Consequently, when a firm obtains the maximum output from a given vector of inputs, or uses minimum inputs to produce a given output, it will be located on the so-called production frontier. The technical efficiency of a firm can be measured by calculating the maximum proportional reduction possible in the use of factors that is compatible with maintaining its level of output. An efficient behaviour would mean that it is impossible to reduce these inputs, while inefficiency would mean opportunities to minimise inputs. If the efficiency index is equal to 1, the firm is considered technically efficient, while if it is less than 1, then the firm is inefficient —meaning that other firms may be able to produce the same output with fewer inputs.

Given that the target value of technical efficiency $TE_{it}^{*}$ will be dependent on a certain combination of factors, the previous equation can be expressed as:

$$TE_{i,t} = \delta_i f(X_{i,t};\beta_i) + (1-\delta)TE_{i,t-1} \tag{3}$$

where $X_{it}$ is a set of variables capable of determining the development of the technical efficiency of wine firms, among which are the firm's internal characteristics and the features of the local environment in which the wineries develop their activity.

## 4. Variables and sample

The variables proposed to be included in the model as firm-specific variables capable of influencing the firm are: size (*Size*), age (*Age*), endowment of physical capital (*StockK/L*), level of debt (*Leverage*) and legal form represented through two fictitious variables, one which indicates whether the winery is a joint stock company and another which represents wine cooperatives.

On the other hand, those that are included as features of the environment in which the winery develops its activity are, firstly, the level of human capital, whose influence on the efficiency of the firm is collected through two variables, *KHext* and *KHint*, representative of the quantity and quality and the human capital respectively. Together with these, two variables are also incorporated which measure the intensity of the presence of agricultural and industrial establishments in the territory (*Densagr* and *Densind*). The greater the density of the network of establishments dedicated to each of these activities, the greater the potential for the creation of networks that facilitate the diffusion relevant information and knowledge. For its part, the variable *Reemp* represents the existing relationship between the number of older employees in relation to the young people who have been incorporated into the labour market. Therefore, this variable makes it possible to approximate the local environment's internal capacity to generate a workforce which is capable of replacing the current population of employees in the medium term, and with this, to maintain the tacit knowledge produced in the heart of the municipality. Finally, the variable *Habitat* symbolises the living conditions in the local environment. The specific definitions of the variables included in the model are compiled in Table 1.

The data used in the analysis has been taken from the Iberian Balance Sheet Analysis System (Sistema de Análisis de Balances Ibéricos, SABI). This is a database that contains information from the Business Register, relating to the balance sheets and profit and loss accounts of more than 1.2 million Spanish firms and 400,000 Portuguese firms. Concretely, the selection of the firms for the sample has been carried out by basically combining two essential criteria, as well as that which relates to location in Spain. Firstly, the main activity of the firm should correspond to C*ode 1593 (Wine elaboration)* in accordance with CNAE-93. Moreover, the firm should have complete information for 2000 to 2010, the years that are referred to in the analysis carried out. After eliminating cases that presented anomalies or incongruences, the combination

of the two criteria resulted in obtaining a sample made up of 731 wineries. The data relating to the conditions of the local environment in which the wineries develop their activity have essentially been taken from the 2001 Population Census produced by the National Institute of Statistics (Instituto Nacional de Estadística, INE).

**Table 1.** Description of variables

| *Variable* | *Description* | *Source* |
|---|---|---|
| $TE_1$ | Technical efficiency for 2010 | (Hernández *et al.,* 2013) |
| $TE_0$ | Technical efficiency for 2000 | (Hernández *et al.,* 2013) |
| *DIM* | Fictitious variable which takes the value of 1 if the LLMA has the features of an industrial district. | (Boix and Galletto, 2006) |
| *Size* | Size of the firm | SABI |
| *Age* | Age of the firm | SABI |
| *Coop* | Fictitious variable which takes the value of 1 if the firm is a cooperative | SABI |
| *SA* | Fictitious variable which takes the value of 1 if the firm is a joint stock company | SABI |
| *Leverage* | Level of debt | SABI |
| *StockK/L* | Ratio of physical capital to employee | SABI |
| *KHint* | Level of education index (Pob 30-39) | Censo de Población, 2001. INE. |
| *KHext* | % of the population taking post-compulsory studies | Censo de Población, 2001. INE. |
| Densind | No. of industrial firms per 1000 inhabitants | Censo de Población, 2001. INE. |
| Densagr | No. of agricultural firms per 1000 inhabitants | Censo de Población, 2001. INE. |
| *Reemp* | Ratio of the population between the ages of 55 and 59 to that between the ages of 20 and 24 resident in the municipality | Censo de Población, 2001. INE. |
| *Habit* | Habitability index for the municipality | Censo de Población, 2001. INE. |
| $Region_j$ | Fictitious variable that takes the value of 1 if the firm is located in the autonomous community (reference region, Catalonia) | |

## 5. Empirical approach

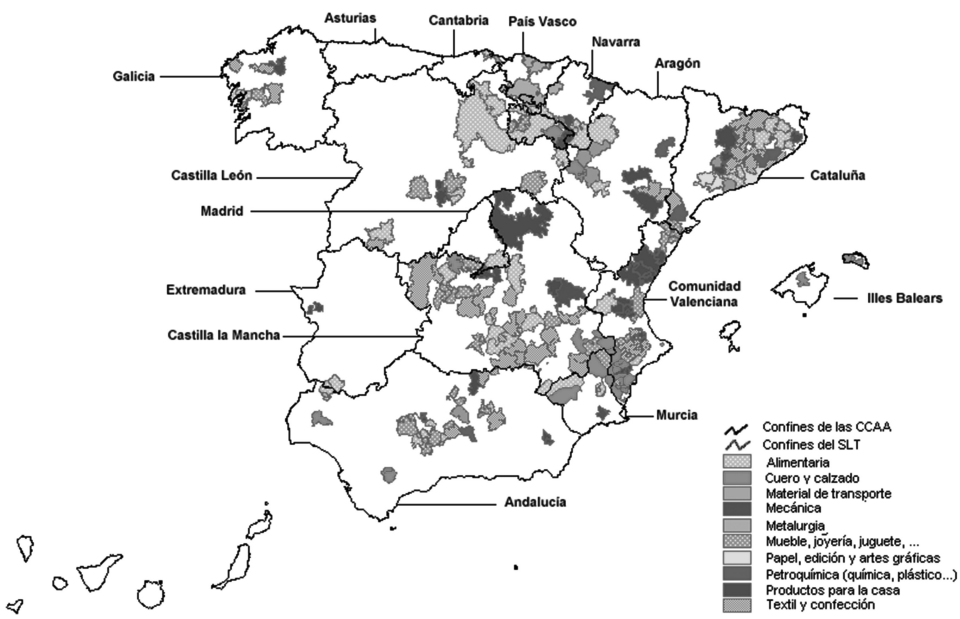
As was pointed out in the introduction to this paper, one of the aims of our research is to try to explain the existence of differences in the efficient performance of firms in the wine sector, taking into account whether or not they are located in a territory with the characteristics of an industrial district, according to the Marshall-Becattini definition of the concept. To do this, it is necessary to carry out or previously have obtained a geographical delimitation of these districts. In this study, the map of industrial

districts in Spain, developed by Boix and Galletto (2004, 2006) and Boix and Trullén (2011), following the methodology used by the Italian National Institute of Statistics (Istituto Nazionale di Statistica: ISTAT, 1997; 2005) will be taken as a reference.

This is made up of two stages: firstly, they proceed to identify the local labour market areas (LLMAs) which will be used as reference points of geographical units. Once this has been done, the identification of potential industrial districts is carried out through a procedure consisting in the calculation of a series of nested indicators of concentration. Thus, first of all, the LLMAs that are specialized in the manufacturing industry are identified. From these, those characterised by a predominance of small and medium-sized firms are selected. Next, the main industry in each SME manufacturing LLMA are determined and, finally, whether or not the majority of work corresponding to the industrial district is concentrated in small and medium companies is verified.

Due to the application of this methodological framework, and using data from the Census and from the Central Business Register (Directorio Central de Empresas - DIRCE) developed by the INE, Boix and Galletto (2004) identify 237 industrial districts (Figure 1) which are reduced to 205 in the second version of the map (Boix and Galletto 2006; Boix and Trullén 2011). The autonomous regions with the greatest number of districts are Valencia (54 districts), Castilla-La-Mancha (44 districts) and Catalonia (35 districts).

**Figure 1.** Map of the Spanish Industrial Districts. 2001




Source: Boix and Galletto (2004).

Given that the location of the municipality logically appears in the data provided by SABI, it has been possible to assign each firm in the sample to a specific LLMA, and by extension, identify which firms in our sample are located in LLMAs that meet the basic preconditions to be considered industrial districts.

Some of these industrial districts coincide precisely with geographical environments with a long tradition in the wine industry in our country and whose production enjoys the protection and guarantee that a Designation of Origin (D.O.) provides. This is the case of the Haro and Logroño districts, which are made up of territories from the autonomous communities of La Rioja and the Basque Country, the Villafranca del Penedés and Sant Sadurni d'Anoia districts in Catalonia and the industrial districts of Manzanares, Tomelloso and Villarrobledo in Castilla-La Mancha, which fit within the D.O. Wines of La Mancha, and that of Valdepeñas, which is assigned to the D.O. of the same name. However, we also find LLMAs specialised in the wine industry that, nonetheless, present a form of industrial organisation that is different from that of the district, such as the LLMA of Aranda de Duero and Toro in Castilla-León, and that of Jerez de la Frontera in Andalucía, all of which are also protected by a D.O.

This leads us to wonder if wine companies located in industrial districts exhibit a superior performance as compared to those located in other production environments. For our sample, we find that the 376 firms located in industrial districts have an average technical efficiency higher than the value corresponding to wine firms located in other LLMAs (Table 2). This encourages us to investigate the existence of a district effect also for the wine industry. The results obtained are presented in the next section.

**Table 2.** Average technical efficiency by type of LLMA

| | $TE_0$ | $TE_1$ |
|---|---|---|
| District average (376 firms) | 0.4038 | 0.4260 |
| Non-district average (355 firms) | 0.3765 | 0.4031 |
| Total sample | 0.3905 | 0.4148 |

## 6. Results

In order to investigate the factors that can influence the efficiency of wineries we estimated the following model described in Section 3:

$$\begin{aligned} TE_i^1 = {} & \alpha_0 + \lambda TE_i^0 + \beta_1 DIM_i + \beta_2 Size_i + \beta_3 Age_i + \beta_4 Coop_i + \beta_5 SA_i + \beta_6 Leverage_i \\ & + \beta_7 StockK/L_i + \beta_8 KHint_j + \beta_9 KHext_j + \beta_{10} Densind_j \\ & + \beta_{11} Densagr_j + \beta_{12} Reemp_j + \beta_{13} Habit_j + \sum_{1}^{n=16} \beta region_{nj} + \varepsilon_i \end{aligned} \quad (4)$$

In equation (4), the subscripts *i* and *j* precisely indicate whether the variable is from a firm or territory. The dependent variable ($TE_{it}$) represents the technical efficiency of the winery in the year 2010, while $TE_{it-1}$ quantifies the corresponding efficiency for the year 2000. As indicated above, these indices were calculated in a previous paper from the use of mathematical programming techniques and represent the differences that separate each firm from the boundary of the best practice established by the most efficient wineries in the sample (Hernández *et al.,* 2013).

The correlation among the variables, and the scale means and standard deviations for each of the measured variables in the model are displayed in Table 3. Due to the presence of the delay of the dependent variable in the set of explanatory variables, the model has been estimated through maximum likelihood methods (Wallis, 1972). The results obtained are shown in Table 4. We have no detected any heteroscedasticity problems in the data. In addition, the normality of the variables was investigated by calculating the skewness and kurtosis coefficients, so that the variables which did not follow a normal distribution were transformed to avoid problems in the maximum likelihood estimation. Furthermore, the average variance inflation factor of the variables analysed is 1.48 which indicates that the analysis is not affected by multicollinearity problems.

The first comment refers to the fact that level of technical efficiency reached by the wine firm in the past does not determine its future efficiency, or better expressed, it is not a factor that guarantees that the firm will maintain its previous position in the efficiency ranking of the firms that make up the sample analysed.

Nevertheless, what can be observed is that wineries located in industrial districts seem to exhibit a superior level of efficiency in relation to those located in other types of LLMAs, thus again confirming the district-effect which is usually referred to in literature regarding industrial districts, although the magnitude the influence is not excessively high.

With regard to the potential effect of the characteristics of the winery on the level of efficiency, the first to be seen is the significant positive influence of the size of the firm. In this case, the size of the firm can act as a proxy measure of the availability of financial and human resources. In contrast, the age of the firm is a factor that displays a negative effect on efficiency. From this, it can be deduced that in today's wine sector, the knowledge obtained through experience acquired over time is not a significant enough value to guarantee efficient management of the productive process. On the contrary, this experience can turn into inertia which is detrimental to adaptation to changes in the economic environment and the incorporation of innovation.

On the other hand, as in Pestana and Gomes (2007), our results point to the legal form as a factor that conditions the efficiency of wineries. In particular, wine cooperatives can be seen to have an improved performance in relation to other legal forms such as private limited companies and limited liability companies. However, neither the firm's level of debt nor its level of capitalisation seem to be factors that determine its technical efficiency.

**Table 3.** Pairwise correlations, unstandardized means and standard deviations

| | *TE1* | *TE0* | *Size* | *Age* | *Coop* | *SA* | *Leverage* | *StockK/L* | *KHint* | *KHext* | *Densind* | *Densagr* | *Reemp* | *Habit* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $TE_1$ | 1 | | | | | | | | | | | | | |
| $TE_0$ | –0.002 | 1 | | | | | | | | | | | | |
| *Size* | 0.017 | 0.118 | 1 | | | | | | | | | | | |
| *Age* | –0.002 | 0.067 | 0.373 | 1 | | | | | | | | | | |
| *Coop* | 0.065 | –0.019 | 0.038 | 0.319 | 1 | | | | | | | | | |
| *SA* | 0.016 | 0.054 | 0.331 | 0.408 | –0.170 | 1 | | | | | | | | |
| *Leverage* | 0.004 | 0.022 | –0.089 | –0.112 | –0.033 | –0.131 | 1 | | | | | | | |
| *StockK/L* | 0.048 | –0.003 | 0.071 | 0.067 | 0.050 | 0.171 | –0.007 | 1 | | | | | | |
| *KHint* | 0.007 | –0.029 | 0.082 | –0.038 | –0.150 | 0.116 | –0.069 | 0.057 | 1 | | | | | |
| *KHext* | 0.009 | –0.060 | 0.072 | –0.016 | –0.073 | 0.110 | –0.046 | –0.001 | 0.623 | 1 | | | | |
| *Densind* | 0.061 | 0.015 | –0.118 | –0.091 | –0.045 | –0.002 | –0.016 | 0.093 | 0.088 | 0.079 | 1 | | | |
| *Densagr* | 0.003 | –0.036 | –0.026 | –0.038 | 0.028 | –0.033 | 0.026 | 0.008 | 0.007 | 0.053 | –0.031 | 1 | | |
| *Reemp* | –0.040 | –0.016 | –0.134 | –0.153 | –0.023 | –0.086 | –0.033 | 0.004 | 0.241 | 0.090 | –0.047 | 0.097 | 1 | |
| *Habit* | –0.029 | 0.027 | 0.111 | 0.093 | –0.048 | 0.152 | –0.034 | 0.017 | 0.237 | 0.193 | –0.047 | –0.081 | –0.137 | 1 |
| *MEAN* | 0.415 | 0.390 | 18.56 | 24.75 | — | — | 95.79 | 508.0 | 2.74 | 36.73 | 10.04 | 4.33 | 0.812 | 61.26 |
| *SD* | 0.171 | 0.184 | 46.02 | 15.34 | — | — | 167.8 | 457.5 | 0.21 | 8.81 | 22.08 | 32.09 | 0.307 | 6.62 |

**Table 4.** Results of the estimation. Standardised coefficients.

| *Variables* | *Coefficient* | *Std. Err.* | *z* | *P>\|z\|* |
|---|---|---|---|---|
| $TE_0$ | –0.020 | 0.0371 | –0.5 | 0.616 |
| *DIM* | 0.089 | 0.0173 | 1.77 | 0.077 |
| *Size* | 0.074 | 0.0065 | 1.64 | 0.100 |
| *Age* | –0.091 | 0.0173 | –1.76 | 0.078 |
| *Coop* | 0.073 | 0.0417 | 1.56 | 0.118 |
| *SA* | 0.028 | 0.0165 | 0.57 | 0.566 |
| *Leverage* | 0.005 | 0.0000 | 0.13 | 0.895 |
| *StockK/L* | 0.027 | 0.0086 | 0.64 | 0.520 |
| *KHint* | 0.114 | 0.0517 | 1.76 | 0.078 |
| *KHext* | –0.04 | 0.0010 | –0.76 | 0.446 |
| Densind | 0.081 | 0.0004 | 1.66 | 0.098 |
| Densagr | 0.017 | 0.0002 | 0.42 | 0.673 |
| *Reemp* | –0.043 | 0.0249 | –0.94 | 0.348 |
| *Habit* | –0.039 | 0.0012 | –0.84 | 0.399 |
| $\alpha_0$ | 0.2927 | 0.1588 | 1.84 | 0.065 |
| *Log likelihood* | 245.39838 | | | |

With regard to the variables relating to the immediate environment in with the firm develops its activity, it can firstly be observed that the proportion of the population that continue their studies after compulsory education is not as important as the level of education they achieve. In other words, this means that, more than the quantity of available human capital, what is really relevant is its quality. Apart from this, the only territorial variable that exhibits a significant influence on the firm's technical efficiency is the density of the networks of industrial establishments located in the area. This result is likely to indicate the existence of beneficial effects for business performance derived from synergies between firms located in the same territory and, in short, the emergence of knowledge spillovers in the wine industry.

## 7. Conclusions

The aim of this paper is to further research on the explanatory factors of the differences in the efficient performance of wine firms taking into account the possible influence of territorial externalities. In previous research, the study of the so-called district-effect has been addressed through a methodology based on non-radial mea-

sures of technical efficiency. In these, the presence of a differentiating performance was noted in terms of the efficiency between firms located within a hypothetical industrial district in relation to those outside of it.

On the basis of a sample of 731 Spanish wineries with information for the period 2000 to 2010, a methodology based on parametric adjustment models has been applied, obtaining the following results: first of all, it can be observed that the wine firms located in industrial districts have a higher level of efficiency in relation to those outside of it; thus confirming the influence of so-called territorial externalities. Regarding the internal characteristics of the winery, it should be noted that there is a direct relationship between the size of the firm and efficient performance. At the same time, cooperatives show a higher level of efficiency in relation to other legal forms. The favourable influence of the quality of human capital on the total efficiency of the firm is also significant. However, the age of the winery is not shown to be relevant when explaining the levels of efficiency reached.

The results achieved mean a considerable advance in relation to previous studies and have made it possible to confirm the great possibilities that the methodologies used offer the analysis of the sector. At the same time, this encourages us to continue to further the study of the internal functioning of wine firms and the changes that they have undergone in the last few years, as well as to continue to research the role that the territory plays in the differential in efficiency seen between wineries.

In the same way, these results can encourage policy makers to pursue policies which implement the «social atmosphere» of industrial districts and give incentives to societal cooperatives, not only for social reasons. The best practices in efficiency in these business scenarios mean that competitiveness in the sector will also benefit, as will, therefore, the general interests of the economy and society.

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