SOCIAL CAPABILITIES AND INNOVATION:
A CASE OF INDUSTRIAL DISTRICT IN SOUTHERN ITALY

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ABSTRACT

The aim of this research is to analyze the key role that knowledge, Social Capabilities and innovations play in the transfer and diffusion of tacit knowledge in an industrial district and how this creates new knowledge and innovation. The study is also focused on a measure of Social Capabilities within a district using a composite indicator and we investigate the effective role of these inputs in stimulating innovative activity in an industrial district performance. The analysis, measuring Social Capabilities, requires data collection using a questionnaire designed to obtain information which permit the development of qualitative and quantitative indicators.

In contrast with the neoclassical production function, where economic growth depends only on traditional resources such as capital, labour and technology, which is an exogenous datum, in the cognitive approach we must consider the residual variables of Social Capabilities and knowledge. These, in fact, represent the key variables to understand the recent structural changes and competitiveness of an industrial district. In this work, the peculiarity of knowledge rests on Social Capabilities or social abilities to increase the process of the accumulation of knowledge and of the network broadening. The former depends on the degree of cumulativeness, and appropriability, represented by the capacity of new knowledge to generate further new knowledge and innovation. The greater is the degree of appropriability of knowledge and in particular of tacit knowledge, the smaller becomes the capacity for its diffusion in a district and its growth. A higher level of knowledge and Social Capabilities corresponds to a higher degree of innovation. The diffusion of the network depends on the degree of cooperation and on the positive externalities of an industrial district.

In the theoretical part, the discussion focuses on the concept of knowledge and of Social Capabilities, on the different typologies of knowledge, its creation and diffusion in firm networks utilizing Nonaka and Takeuchi’s model, on the nature and definition of Social Capabilities in the industrial district and on the relationship among these and innovation.

The empirical aspect is based upon original results of surveys carried out on a sample of entrepreneurs in Southern Italy specializing in a special industrial district composed of wedding dresses and baby dresses utilizing a multi-method approach. To highlight the relationship existing between innovation and Social Capabilities, we chose our sample within three categories, classical, innovative and traditional/fashion utilizing the academic classification. We measure Social Capabilities, we describe the Social Capabilities diffusion in the case study and finally we present our empirical analysis estimating an innovation equation.

Keywords: Social Capabilities, Knowledge, Innovation, Special Industrial District, Southern Italy
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CHAPTER 1

INTRODUCTION AND OUTLINE OF THE RESEARCH FRAMEWORK

1.1 Introduction

The main aim behind this research is to analyse the key role that knowledge and Social Capabilities (SC) play in the transfer and diffusion of tacit knowledge within an industrial district and how this creates new knowledge and innovation. The focus is also centered on measuring the Social Capabilities within an industrial district localized in a specific area using the scoreboard approach and we investigate the effective role of these inputs in stimulating innovative activities in an industrial district performance too.

Three are then the central aspects of this research as a whole. The first aspect is represented by knowledge and Social Capabilities that are the two central dimensions examined in this work. We investigate the concept of "knowledge" and of "Social Capabilities" because they are not used univocally in literature. Many and different questions are the perspectives and the contexts in which they are examined by economists as well as by philosophers, scientists, sociologists. This work does not claim to dissolve this conceptual problem, but it focuses its attention on the role of knowledge and Social Capabilities in the industrial districts. In any industrial district, in fact, as it is emphasized in the industrial district literature (Marshall 1890; Becattini, 1989; Langlois and Robertson, 1995), an important role is attributed to the (tacit) forms of knowledge spillovers among firms. The traditional industrial district literature tended to emphasize the role of social and cultural proximity between agents for knowledge sharing but it ignored the role of the Social Capabilities and the firm interaction for knowledge creation. It is true that local and agent relations are an important source for the exchange knowledge and the human resources are seen as workers with specific knowledge, skills and capacity. But the role of the firm is fundamental, too, and the firm can be considered the centre that governs the knowledge needed to produce and spread technology. In other words, in this work, knowledge with its different dimensions and Social Capabilities with their different characteristics are important to understand the recent structural changes and the economic growth of the industrial districts. Particularly, they are considered the key variables to understand their recent changes in structure, innovation and competitiveness in a global market. Based on the cognitive approach, knowledge is not considered a simple other resource to add to the traditional ones (labour, capital and earth), but it is the most
important resource. It has become the resource and not a resource (Drucker, 1993). Its role is fundamental in the cognitive approach and it is the decisive factor in the survival of district firms in a global market. The Social Capabilities are considered a residual indicator, another important intangible factor which is usually used to explain the growth processes of a nation, or, as in this research, of an industrial district. The definition of Social Capabilities adopted is associated with the enlargement the knowledge-learning process and network diffusion and it is one of the principal inputs with respect to district firm innovative activity. Social Capabilities increase the process of transfer, diffusion of knowledge that grows as much as the firm and group relations are intensive. Particularly, in this work, the peculiarity of knowledge is the Social Capabilities or social abilities to increase the knowledge learning process and network diffusion. The first one depends on the degree of cumulativeness, and appropriability, which represents the capacity of a new knowledge to generate more new knowledge and innovation. The greater the degree of appropriability of knowledge is and in particular of tacit knowledge, the smaller the capacity for its diffusion in a district and its growth are. A higher level of knowledge and Social Capabilities corresponds to a higher degree of innovation. Innovation can be considered as the eventual outcome of the processes of knowledge creation, and as the main input to the knowledge production function. At the same time, a growth in knowledge is increased by technological change. Knowledge in an industrial district is the sum of the knowledge of every firm of the district and, as a matter of fact, knowledge is the result of networks among the different local actors (individuals and firms). So in this work we consider the different knowledge characteristics and we explain how knowledge is created, how the firms and individuals can acquire, diffuse and develop this knowledge and what knowledge dimension is easier to transfer. Knowledge is a dynamic variable whose value derives from learning by interacting (Lundvall, 1992), learning by doing (Smith, 1776; Arrow, 1962), learning by using (Rosenberg, 1982), from firm relations and from social networks. But knowledge is not only distributed, it is also produced (Nonaka, 1994; Nonaka and Takeuchi, 1995). This knowledge production is the result of complex cognitive processes that are based on firm organization. According to Nonaka and Takeuchi’s model (1995), which is the conceptual approach used in this work¹ and applied to the industrial district, knowledge is generated in four phases. The first is called “knowledge socialization”, which is the source of tacit knowledge founded on an industrial district and results from experience among individuals; and it is difficult to acquire. In the second phase this tacit knowledge is explained using a formal language to make it explicit. In the third phase, the explicit knowledge spreads and becomes integrated with previous

¹ We chose Nonaka and Takeuchi’s model because of the vast literature on the industrial district that does not explain how knowledge transfer happens or changes over time in industrial districts and how innovation happens, too.
knowledge, producing a combination of knowledge. In the fourth phase, through a process of learning by doing, the explicit knowledge is embedded in different contexts and becomes tacit. Thus, the knowledge produced in an industrial district results from the recombination of four kinds of knowledge inputs: internal codified; internal tacit; external codified and external tacit (Antonelli, 1996, 1999, 2003).

But the Nonaka and Takeuchi model has various shortcomings when used in this way. In this work, we consider, then, the critiques to the Nonaka and Takeuchi model.

We add that in a global market, where the industrial district is global and not only local, an open district obtains more advantage from external sources of knowledge. This opening district takes advantage and more performance from the embeddedness external knowledge, new resources and competences.

The attention on Social Capabilities and on their characteristics is extensive in this work because of the construction of the composite indicator in the empirical part. In order to develop a rigorous analysis of the notion, it is necessary to go back to the historical origins and to its adoption in the literature. We start, in fact, from the capabilities (Richardson, 1972; Penrose, 1959, 1985; Foss, 1996; Loasby, 1998a, 1998b) and dynamic capabilities (Teece, Pisano and Shuen, 1997; Leoncini and Montresor, 2008) concept to arrive at the Social Capabilities.

We emphasize that if Richardson together with Penrose is considered the founder of capabilities, Abramovitz is the founder of the Social Capabilities. We also remember that the planned coordination is not only of the single firm, but it may be through the cooperation of independent firms and, as it is emphasized by Marshall (1890), the relationships created among firms must be integrated with the relationships with suppliers, customers, providers of services. In this way the internal capabilities are combined with external ones and this may be in an industry as in an industrial district.

To identify the characteristics and elements of Social Capabilities, we remark that when Abramovitz (1956, 1989) explains economic growth which has occurred over a long period, through the natural resources, such as technological congruence and Social Capabilities, he is identifying the principal components of these latter in terms of the social abilities of the population and institutional characteristics. In other words he refers to those factors constituting a country ability to introduce or engage in technological and organizational progress (Ohkawa and Rosovsky, 1973). In the Social Capability concept it is possible to include the characteristics and qualities not only of a population, but also of economic, political and social organizations (Abramovitz and David, 1996) that govern the actions, behaviours and relationships of agents. Social Capabilities are
therefore at the base of the interactive and cumulative process that stimulates economic growth and favors its strengthening.

If, however, these elements can help explain the growth of a country, the growth of an industrial district requires the addition of other elements, identified in the works of Marshall (1890), Penrose (1959, 1985) and Becattini (1981).

To identify the Social Capabilities in industrial district we must highlight, in fact, that this organization (Marshall, 1890) echoes Darwin’s theory of natural selection. The analogy between economics and social science stresses that every part of an organism (the district) is dependent on the other parts (the economic agents) for the achievement of wellbeing. Productive capacity depends on the accumulation of knowledge and the growth of industries and is increased by the character of the people, their social and political institutions, liberty of activity and initiative. For him, Social Capabilities represented the religious, political and economic elements that characterize people’s history. Marshall also distinguishes between “general ability” and “personal ability”: the first denotes general knowledge, capability and intelligence. The “personal ability” is the special purposes of individual trades. But as we evidence, the modern industrial district is in continuous evolution, all the characteristics of the traditional one are not present. For this reason we add other elements that characterize Social Capabilities. They are identified as the spatial and moral forces (Becattini 1981) that bind nations together; the geographical, cultural and social proximity of firms as well as the decentralized phases of product processing. The role of physical and human resources and Penrose’s collective knowledge (1959, 1985) is fundamental, not only to provide a new way of conceiving Social Capabilities, even if she does not use this term expressly, but also for firm growth. The competence of the firm in question is the sum of individual competences, and the firm employees own knowledge, that can also have the capacity to increase through learning by doing.

Despite the fact that the elements that characterize the SC in the literature are varied, it is believed that the root causes for industrial districts are to be identified in the historical determinants together with the economic, social and institutional relationships, spatial conditions and innovation.

Taking into account these aspects, for the purpose of this work, the characteristics and the elements of the Social Capabilities in an industrial district include the geographical proximity - openness for the Spatial conditions; the tradition, social relationships, skills and ability, knowledge, learning for the Social conditions; the innovation, human resources, organization, knowledge, markets, firm relationships, internationalization for the Economic conditions; the social and political institutions for the Political conditions and the technological and organizational progress for the Innovation.
The second main aspect presented in this contribution is represented by the possibility to measure the Social Capabilities in an industrial district. Measuring Social Capabilities, in fact, is very complex since not all the highlighted determinants can be subject to empirical verification and they are intangible elements, residual and often incorporated into tacit knowledge dimension. A literature that can help us in defining and measuring them accurately is not always available for all the identified indicators. Social Capabilities are usually non-market and non-accounted in regional and national dataset. The only consistent way to measure the Social Capabilities is by implementing survey-based approaches aimed at producing specific information by structured questionnaires. In this research, in fact, considering the definition of Social Capabilities adopted and implementing it through the questionnaire use, we propose a measure of Social Capabilities. We measure the Social Capabilities within a specific area localized in the South of Italy, using the scoreboard approach (Hollanders and van Cruysen, 2009; IUS Report, 2011) while for the construction of the composite indicators we were guided by the OECD Handbook (2008).

The third purpose of this research is to investigate the effective role of these inputs in stimulating innovative activities in a special clothing industrial district composed of wedding and baby clothing districts localized in the South of Italy. After explaining the reason for chosen the garment sector and the specific areas, we present the original results of survey conducted utilizing a multi-method approach and we pause particularly our attention on the role of knowledge, Social Capabilities and innovation and on the knowledge sharing in the case studies. To highlight the relationship existing between innovation and Social Capabilities, we chose our sample within different categories (classical, innovative and traditional/fashion) utilizing the academic classification. We construct this academic classification which is based on Pavitt’s taxonomy and Peneder’s tripartite classification, to better understand the importance of the fashion industry. Finally we present our empirical analysis estimating an innovation equation. (Cainelli, Mancinelli and Mazzanti, 2007). The empirical analysis is based on a firm level and on the use of a large data-set constructed using the questionnaire data and we estimate a regression using a robust estimator for the Probit model.

The principal questions to which we want to answer with this work are the following:

**Key research questions**

- What role does knowledge play from an economic point of view?
- How does personal knowledge become social knowledge and how does firm knowledge become district knowledge?
What role do Social Capabilities play in the transfer and diffusion of tacit knowledge in industrial district?

What are the relationships between knowledge and the firm and knowledge and innovation?

What are the relationships between Social Capabilities and the industrial district and the Social Capabilities and innovation?

**Conceptual model**

- We analyse knowledge and Social Capabilities creation and diffusion within districts (how, where and why).

**Empirical Challenges**

- How is it possible to measure the Social Capabilities within an industrial district?
- Why do we consider special clothing industrial district?

**1.2 Outline of Research Framework and Structure**

The work is divided into nine chapters.

**Chapter 1** provides an introduction, describes the key object, the key questions and provides an outline of the research.

**Chapter 2** consists of a literature review about the nature of knowledge, its different definitions and its various dimensions. We reflect on the role of knowledge in economics, in technology and in science. We consider the various properties and the different levels of knowledge from personal knowledge to social, organizational, inter-organizational or district knowledge and we analyse the diffusion of knowledge in an industrial district. In this context, attention is focused on:

- What does knowledge mean?
- What is the difference between the tacit and codified dimension?
- Conceptualization, epistemology and elements of knowledge in economics;
- How does personal knowledge become social knowledge and how does firm knowledge become district knowledge;
- The importance of knowledge in science and of knowledge in technology
- The relations between knowledge and the firm and knowledge and innovation;
**Chapter 3** consists of a literature review on Social Capabilities starting from the capability concept. We consider the Social Capabilities historical origins and its adoption in the literature. The Social Capability concept adopted is defined as a capacity or ability derived from social and firm networks and the Social Capabilities are acquired through years of experience. The Social Capabilities depend on economic, political, institutional and innovation characteristics and they are synonymous with the “accumulation of tacit knowledge” and for some aspects they are associated with social capital. In this context, attention is focused on:

- Capability concept
- Conceptualization, epistemology and elements of Social Capabilities in the literature;
- The difference between Social Capabilities and social capital;
- The Social Capability concept and Social Capability characteristics in the industrial district
- The relationship between Social Capabilities and innovation.

Considering the fact that the modern industrial district is in continuous evolution and that a strong theory, explaining how knowledge is created and diffused in the industrial district and how innovation happens, does not exist, in **Chapter 4**, we describe the conceptual model based on the Nonaka and Takeuchi model and we apply it to industrial district. This model, in fact, for us, is the best developed one in the literature and it can be used not only to stress the knowledge creation and diffusion in an industrial district, but also to explain how innovation happens in a firm and in an industrial district. However this model when used in this way presents various shortcomings.

The empirical methodology is provided in **Chapter 5** and offers answers to the questions of how we study knowledge and Social Capabilities in the district; why the garment industry was chosen for this study; why the particular Southern Italian districts were chosen; and why we decided to study some types of products for three categories.

We use the ISTAT data (2001 and 2011), Istat Report (2005), the National Observatory of the Italian district Report (2013) and the IPI data (2009) to identify the Italian industrial districts number and the Southern Italy areas in the textile (ATECO:13) and clothing (ATECO:14) specialization. The ISTAT, KOMPASS and Infoimprese data are used for the identification of sectors, divisions, categories and areas.

We compare industry classification and our academic classification to find the most important categories for product. Through the academic classification we can catch the different sources of knowledge inputs, the different labour skills and Social Capabilities used in this sector and in addition to the different elements involved in design, fashion and innovation. To identify the
company name of the most famous companies which operate in the selected categories in Italy we use KOMPASS and Yellow Pages data.

We have chosen to study the garment industry.

The area chosen is the Apulia region in Southern Italy for the presence of the Apulia Fashion district. Mainly we select the southern and the northern areas of Bari.

The selected categories are: Classic (weddings), Innovative (external clothing), and Traditional/Fashion (knit goods)

The types of products are: hosiery (pullovers), wedding dresses, underwear, and sport wear/outerwear.

The case study identified is composed of the wedding dress district and the baby clothing district that together form the “special industrial district” as we call it.

In Chapter 6, the analysis starts with the description of the economic situation in the Southern Italy and in Apulian region. In this scenario, we focus our attention on the evolution of the industrial district with particular reference to the Apulia Fashion District recognized in 2010.

Chapter 7 analyses the key role that knowledge, Social Capabilities and innovations play in an Italian industrial district using empirical results. This chapter recalls the reason why we have chosen to analyze the wedding and baby clothing subdivisions in the clothing sector. We focus our attention on the original results of survey conducted on a sample of entrepreneurs in the southern and the northern areas of Apulia in Southern Italy, specialized in wedding dresses and in baby dresses (ceremonial clothing, hosiery and outerwear) during the year 2011. We conduct an empirical analysis based on a dataset of information at district level built by the multi-method approach.

In Chapter 8 we implement the Social Capabilities definition through the questionnaire use and we explain each question used into questionnaire to implement, explain and measure the Social Capabilities. To measure them we used the “scoreboard approach” (Hollanders and van Cruysen, 2009; IUS Report, 2011) while for the construction of the composite indicators we were guided by the OECD Handbook (2008) and by Nardo et al. working paper (2005). We measure the Social Capabilities in the Wedding district and in the Baby Clothing district and we describe the empirical results in this Special industrial district using the innovation equation.
Chapter 9 provides a synthesis of the research and presents some concluding remarks and reflections.

1.3 Key Findings

This study shows that knowledge, Social Capabilities and innovation are the key variables in understanding the recent structural changes in technical and organizational terms, observed in the industrial district. The results of the case study suggest that the composite index designed to measure the Social Capabilities through the scoreboard approach is high, as is the capacity of knowledge diffusion in the district that influences district innovative activity in a positive way. Thus innovation in this traditional and low-tech sector does not only involve large enterprises but small and medium-sized businesses as well.
CHAPTER 2

THEORETICAL ASPECTS OF KNOWLEDGE AND TACIT KNOWLEDGE

2.1 Introduction

The central goal of this chapter is to analyse how knowledge is transferred and diffused in an industrial district and how this creates new knowledge and innovation thus improving the performance in the industrial district.

For the comprehension of these fundamental aspects we begin the discussion with an introduction of the knowledge conceptual problem and of the different dimensions of knowledge (section 2.2). Attention is focused particularly on the role of knowledge in economics (section 2.3) and on the role of knowledge in technology and science (section 2.4). We arrive at the core of the chapter in section 2.5 where we consider the various levels of knowledge from the personal knowledge to the social, organizational, and inter-organizational or district one and we analyse the diffusion of knowledge in an industrial district\(^2\). For the important implication that knowledge has on innovation, in section 2.6, we consider the interaction between knowledge and innovation that are the way to improve the industrial district performance. The conclusion follows in section 2.7.

\(^2\) In one of Sforzi’s article (2008) it is evidenced that the notion of industrial district was introduced in Italy by Becattini (1962). Considering the Marshall’s notion of industrial agglomeration, Porter, in 1990, and Krugman, in 1991, consider the spatial agglomeration an important characteristic of an industrial district and cluster. Porter associates the cluster to the industrial district and the latter is considered a special case of the first. In other words, according to Porter the notion of cluster includes the district notion and he thinks it is possible to use the two notions as substitutes because they would indicate the same phenomenon: a territorial agglomeration of economic activities, which bring great advantages to these grouped firms compared to the isolated ones. But really in the strict meaning the term cluster is not interchangeable with the word district. The district of Becattini and of the Italian school is first of all a local community, the socio-cultural and institutional place where the firms operate and it is a condition of life (Sforzi, 2008, p.73). For the cluster notion, on the contrary, it is important above all the industrial agglomeration, but it is not a well-defined term.

On the other side, one should remember that in the literature on industrial districts, the terminology used to define geographical proximity is very broad. The reference can be made to a cluster (Porter, 1998), to a ‘milieu innovateur’ (Camagni, 1995), to ‘industrial districts’ (Becattini, 1979), to ‘regional innovation systems’ (Cooke, 2001), to ‘learning regions’ (Asheim, 1996), to ‘a local productive system’ or to a ‘manufacturing district’. However, we believe that it does not matter whether one uses one definition or another, despite the different characteristics that distinguish each of these types. They are all possible and otherwise specified, depending on the local context and/or the reality being analyzed. However what we consider important is the rediscovery, especially from the regional economy and from the economic geography, of the agglomerative phenomenon that facilitates the spread of knowledge and innovation, while, at the same time, geographic opening becomes a condition for company survival. So it is not the geographical proximity of firms per se that originates the innovative performance of districts, but the absorptive capacity (Giuliani, 2005), their social capabilities and “when they (firms) are better connected, and when they participate in local network” (Boschma and ter Wal, 2007, p.6).
2.2 The Nature of Knowledge

It is important to begin with an outline of the knowledge conceptual problem, its different definitions and its various dimensions because we must consider which knowledge dimension is easier to exchange in an industrial district, which knowledge dimension is more difficult to transfer and which creates more competitive advantage.

It is also important to take into consideration that knowledge is a very complex subject to analyse and that we cannot review all the epistemological debate on what knowledge means. We can only focus our attention on some contributions that are most useful for us in order to study the different problems regarding the nature of knowledge, its different definitions, and its different dimensions.

It is important to highlight that the discussion on the concept of knowledge, in fact, is not new, it is fundamental, but what “knowledge” means is still far to be clear (De Liso, 2013) because it is used in different contexts, with different perspectives, it is useful for some, useless for others and a mystery for others (Foray, 2006, p.10).

We consider first of all some different problems regarding its definition, its nature and its different dimensions.

<<Philosophers and scientists have debated for centuries on what knowledge means…tackling problems which range from methodology to the role of language. Within these debates we find analyses which range from Aristotle’s syllogism to the Kantian philosophy according to which we cannot know things in themselves, from Bertrand Russell’s theory of knowledge (1913) to Popper’s objective-conjectural knowledge>> (De Liso, 2013, p.14-15).

In fact very different definitions of knowledge exist and this depends on its conceptualization given by philosophers, scientists, pragmatists etc. Philosophers, scientists and logicians agreed that knowledge is a “justified true belief”, even if “…problems continue to emerge all the time” (see, e.g. De Liso, 2013, p.15). Popper (1979), for example, considering that <<...any ...theory of the acquisition of knowledge should be...regarded.>> (Popper, 1979, p.24), gives a solution of the inductive problem.3 This has not validity (truth or falsity), it is a myth, because only objective or conjectural knowledge exists and only this

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3 For the empiricists (Aristotle and Locke), knowledge is obtained inductively from experience. For the rationalists (Plato and Descartes), knowledge is obtained deductively by reasoning; it is a mental process that exists a priori, and it is in mind. According to Kant, “knowledge arises only when both the logical thinking of rationalism and sensory experience of empiricism work together” (Nonaka and Takeuchi, 1995, p.24).
conjectural knowledge is criticisable. In other words, he emphasises that we must regard all laws or theories as hypothetical or conjectural ones and not as universal laws or science theories (Popper, 1979, p.9).

Searle (1999) with his “Enlightenment vision” thinks that the universe exists quite independently of the human minds, we can understand only its nature, but an observer creates in part the reality observed (Searle, 1999, p.4 and p.6). Since the ideas about knowledge are very different from each other, Steup, in 2009, highlights that <<Some contemporary epistemologists reject the assumption that knowledge is susceptible to analysis>>.

On the contrary, the Boulding’s vision of the knowledge is more sensorial and empiric, because he considers knowledge as the subjective “Image” of the world that is located in space, in time, in personal relations, in value, in sensations, in individuals, in organizations, in society; this Image is private and public and the behaviour of individuals depends on this Image (Boulding, 1956). Based on this Image, knowledge has an organic structure because <<…it follows principles of growth and development similar to those with which we are familiar in complex organizations and organisms.>> (Boulding, 1956, p.17). This Image derives from <<…a constant stream of messages entering the organism from the senses. … [it]...is built up as a result of all past experience...>> (Boulding, 1956, p.6) and it seems that this Image is built as a sequence of pictures (the messages) taken by our mind as photos with a camera. But differently from a simple photos these <<…messages consist of information in the sense that they are structured experiences. >> (Boulding, 1956, p.7) that could change the Image. More specifically <<When a message hits an image one of three things can happen. [The first possible effect is that]…the image may remain unaffected… and...it is ignored by me. [The second possible effect is that]…This information changes my image of the universe...[but] ...in some rather regular and well-defined way...There is... a third type of change of the image which might be described as a revolutionary change. ...the whole thing changes in a quite radical way. >> (Boulding, 1956, p.7-8).

In this context Boulding considers the value scales fundamental because the messages have effect on the Image of any individual or organization.

With a different perspectives Mokyr (2002) considers “useful knowledge”, a term used by Kuznets in 1965, as a source of modern economic growth, but Mokyr differs from Kuznets because he focuses on the role of knowledge in technological and economic change <<Because technology in its widest sense is the manipulation of nature for human material gain...>> (Mokyr, 2002, p.3). This “useful knowledge” includes two types of knowledge: 1) the knowledge “what” or propositional
knowledge (beliefs) about natural phenomena and regularities and 2) the knowledge “how” or *prescriptive* knowledge or techniques. But this distinction differs from the traditional distinctions between science and technology and from the distinction between theory and empirical knowledge (Mokyr, 2002, p.4).

More specifically, for Mokyr the *propositional* knowledge is a *discovery* and it *serves as the support for techniques that are executed when economic production takes place*... It takes two forms: one is the observation, classification, measurement and cataloguing of natural phenomena. The other is the establishment of regularities, principles and “natural laws” that govern these phenomena and allow us to make sense of them. >> (Mokyr, 2002, p.5). The *prescriptive* knowledge is an *invention* resides either in peoples’ brains or in storage devices [as] designs and instructions for how to adapt means to a well-defined end, much like a piece of software or a cookbook recipe>> (Mokyr, 2002, p.10).

But not all techniques are explicit, codified because they are seldom complete; this knowledge is stored in artefacts and in people’s mind or in an external memory.

The rigorous distinction of explicit and tacit dimension of knowledge is in Polanyi’s works (1962a, 1962b, 1983). In fact when Polanyi considers human knowledge, he writes:

<<*There are things that we know but cannot tell...uncertain, or entirely ignorant, of things that we know only by relying on our awareness of them...*>> (Polanyi, 1962b, p.601),

he is referring to tacit knowledge, which is personal, specific and which cannot be communicated in a codified way. It is acquired through the direct experience, and it is the result of a learning process acquired via informal behaviour and procedures. In fact Polanyi continues:

<<*I can say that I know how to ride a bicycle or how to swim, but this does not mean that I can tell how I manage to keep my balance on a bicycle or keep afloat when swimming*>> (Polanyi, 1962b, p.601).

In other words, it is possible that a person does it, but he/she does not have the idea or he/she has the imperfect idea or the wrong idea of how he/she does it. But it is also possible that
"...I know how to bicycle or swim and not know how to coordinate the complex pattern of muscular acts by which I do my cycling or swimming" (Polanyi, 1962b, p. 601).

In other words, a person can know these actions, but he/she cannot say what they are or if they are hard to communicate or formalize. In fact Polanyi emphasizes two kinds of knowing:

1) Knowing a thing by attending it. It is more practical knowing “knowing how” to use Ryle’s expression (1949).

2) Knowing a thing by relying on our awareness of it for the purpose of attending. It is more intellectual knowing or “knowing what” to use Ryle’s expression (1949) or “knowing that” to use Loasby’s expression (1998b).

These two kinds are interdependent dimensions of “knowing” and they are never present one without the other, but the practical one includes the theoretical or intellectual one which has previous been internalized. To use one of Polanyi’s examples:

"We possess a practical knowledge of our own body, but the physiologist’s theoretical knowledge of it is far more revealing. [and] ... in general, an explicit integration cannot replace its tacit counterpart" (Polanyi, 1983, p. 20).

This tacit knowledge exists, but it is not easily visible, formalized and expressible. It is as the biggest hidden part of an iceberg, for using the well-known metaphor of the knowledge “iceberg” (Nonaka, 1994), in which the smallest visible part represents explicit knowledge (Outline 1).

Outline 1- The Knowledge “Iceberg”
It is embodied in people; it is personal in the short period, difficult to communicate and share completely and it is also associated with scientific intuition (Howells, 2002). It is the knowledge of experience (Nonaka and Takeuchi, 1995). Regarding this, Busch and Richards (2003) distinguish two types of tacit knowledge: the first one that is embodied in skills and that can be copied, and the second one that is very difficult to transfer.

The tacit knowledge includes cognitive elements or mental models, technical elements (Nonaka and Takeuchi, 1995) and critical elements (Howells, 2002). Mental or cognitive models are paradigms, beliefs, viewpoints; technical elements include know-how, crafts and skills. The critical elements of the tacit knowledge acquisition are learning by doing (Arrow, 1962), learning by using (Rosenberg, 1982) and learning by interacting (Lundvall, 1992).

The explicit, codified or articulated knowledge (Busch and Richards, 2003), instead, involves a know-how that is transmittable in a formal and systemic language. It is objective and it is in the mind because it is the knowledge of rationality.

As we can see knowledge is a very complex concept that reflects the theoretical or practical understanding of a subject, the facts and skills acquired through experience or education. So we develop in this work particularly Polanyi’s view of knowledge because the tacit and codified dimensions are present both in the individual knowledge and in the social one.

In this context, as economists we focus our attention on the definition, proprieties and role of knowledge in economy and we concentrate our attention on knowledge in technology and science.

### 2.3 A Definition and Properties of Knowledge in Economics

As we have seen the nature and the definition of knowledge is not clear because of the different prospective where it is used. For this reason we concentrate our attention on knowledge in economics where it is considered and it is reduced to an economic good (Forey, 2006).

In neoclassical economic theory, knowledge is considered to be a public good because it is appropriable and transferable and everyone has the same knowledge. Marshall’s notion of

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4 Arrow in his endogenous economic theory considers “learning” the acquisition of knowledge, the product of experience or in other words, the productive activity produces experience that in the long run becomes knowledge and, therefore, learning. The latter takes place through the attempt to solve a problem and during an activity. On the contrary learning in Smith is a repetition of the same operations that generates a speeding up of the production process (Smith, 1776).

5 Rosenberg in 1982 considers aspects of learning as <<…a function not of the experience involved in producing the product, but of its utilization by the final user>> (p.122)

6 With the learning by interacting Lundvall (1992) points out how interaction between producers and users in innovation enhances the competence of both (p.9).
‘knowledge that circles in the air’ is a good example. The neoclassical *homo oeconomicus* has perfect information meant as knowledge and as he is a rational being he acts in an optimal way. Those that do not behave in the prescribed way are automatically excluded through natural selection. Thus, every agent has a vision of the world and acts in a rational and isolated manner, which is not conditioned by others.

Friederich A. von Hayek, in 1937, criticizing the neoclassic hypothesis, remembers as the central problem of economics as a social science is how people acquire and communicate knowledge or in other words he emphasises the problem of “co-ordination” (Loasby, 1998a, p.140) in an imperfect market where different individuals have different bits of knowledge in different fields and the asymmetric and incomplete information is itself a justification to the limitation of each individual’s capability of knowledge. He has emphasised that the only way for increasing the total amount of knowledge in the society is with knowing specialization. <<…there is here a problem of Division of Knowledge which is quite analogous to…the problem of the division of labour>> (von Hayek, 1937, p.49) to quote Adam Smith. At the same time, markets are considered <<…the most effective institutions within which the dispersed and incomplete knowledge of a multitude of individuals could be brought into alignment>> (Loasby, 1998a, p.140). Consequently, if for Smith, the division of labour stimulates the division of knowledge and the development of different knowledge and different capabilities, for Menger (1871) it is the knowledge itself to direct, to drive the division of labour. This seems in contradiction, but Smith and Menger are both right because <<…ideas for a novel division of labour create the conditions for developing new knowledge, which may inspire a further division of labour >> (Loasby, 1998a, p.142).

In 1945, von Hayek re-critics the neoclassical economic theory considering that

<<…the economic problem of society is not merely a problem of how to allocate “given” resources ...
It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality>> (von Hayek, 1945, p.519-20).

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7 Nevertheless, in *Principles of Economics* (Marshall, 1890) he provides evidence of the importance of knowledge, in *Ye Machine* (Marshall, 1867) he had already understood the mind process involved in the creation of knowledge.
The concept of rationality adopted here is the “procedural rationality” as defined by Simon (1959) in which the *homo agens* acts in an uncertain atmosphere and von Hayek at the same time refers to a different kinds of knowledge: the unorganized knowledge, the “general knowledge”, the scientific and codified knowledge, the special knowledge, the tacit knowledge, the theoretical or technological knowledge. In fact, in an economic system which is not characterized by a perfect market where everybody does not know everything the scientific knowledge exists <<…in the sense of general rules: the knowledge of the particular circumstances of time and place>> (von Hayek, 1945, p.521) that gives some advantages above all the others because the individual owns unique information. In this contest, the firm decisions are also taken considering not a general knowledge, but the knowledge of the particular circumstances of time and place.

Some economic works (Nonaka, 1994; Nonaka and Takeuchi, 1995; Howells, 2002) adopt the traditional definition of knowledge as a “justified true belief” in which knowledge is a personal “belief” and emphasize the importance of justified knowledge. It is considered in these works as <<…a dynamic human process of justifying personal belief toward the ‘truth’…>> (Nonaka and Takeuchi, 1995, p.58) and created by the flow of information, or as <<…a dynamic framework or structure from which information can be stored, processed and understood…>> (Howells, 2002, p.872) to become the process of learning.

These two definitions are a good example of the problem of the term knowledge because they emphasize the dynamic knowledge, the relational characteristics and the importance of information as a flow of messages which can add or change knowledge (Machlup, 1983). But knowledge is related to human actions in the first definition, it is created dynamically in a socially constructed process and it requires memory, costs and learning in the second definition and it is an active process that involves cognitive structures for both. Moreover the necessary information to construct knowledge is public, uniformly accessible, and available without effort and cost; it is created in social interactions and may be distributed across society.

For Metcalfe and Ramlogan (2005, p.661), on the contrary, knowledge is a private characteristic of individual; it is “necessarily private, idiosyncratic, individual” because it requires time, investment and effort. In fact they reflect on the fact that if knowledge was a public good as it is information - although this does not imply that it is accessible in a uniform manner (p.661) - it is difficult to understand why the technology transfers are a problem, as well as the difference in growth among

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8 <<…which cannot possibly be called scientific in the sense of knowledge of general rules.>> (von Hayek, 1945, p.521)
countries. The knowledge in their *foundationalism* perspective is instead individual because it depends on perceptions, memory and experience associated with reason. The individual knowledge is subjective, relative, *"It is our private way of making sense of the world..."* (Metcalfe and Ramlogan, 2005, p 657). This knowledge grows from human curiosity, from interaction with others and an individual is aware of knowing just when a problem is solved. (Metcalfe and Ramlogan, 2005, p.657).

It is interesting to add that this individual knowledge is diverse, fragmented, incomplete and embedded in the mind of individuals characterized by latent potentialities. The individual knowledge depends on the private experiences that increased thanks to the social processes through which information is exchanged. It follows that information is *"...an imperfect representation of knowledge [and] can be codified in symbolic form"* (Metcalfe and Ramlogan, 2005, p.658), on the contrary knowledge is tacit. The communication of information and the force of interaction are facilitated by the institutions that play a key role in the economic and social life. The institution of the market permits the combination of this different and personal knowledge and helps the discovery of the new knowledge. In this way, the heterogeneity of individual knowledge has a social effect by means of the establishment of social understanding. This latter, in fact, is social, it is “an open system” (Metcalfe and Ramlogan, 2005, p.659) and it derives from the interaction among individuals in a specific context. In other words, understanding is a socially distributed process of knowledge or social knowledge and its growth depends on the individual interactions. In this context, the *"economic activity depends on shared understanding not shared knowledge"* (Metcalfe and Ramlogan, 2005, p.663) where knowledge is private and understanding is public.

Foray (2006), instead, exploring the black box of knowledge, distinguishes it from information and considers knowledge a matter of cognitive capability where learning and cognition are two central themes in his concept of knowledge. Information instead is a passive and inert datum. If there is no problem in reproduction of information that takes place with duplication without cost, *"the reproduction of knowledge poses a problem that constantly recurs both in technology transfer and in the succession and transmission of occupational or educational skills"* (Foray, 2006, p.71). The cost of reproduction consists of an expansive process because cognitive capabilities are not easy to transfer to others as we have seen in Polanyi in 1966, particularly because of the presence of tacit knowledge, a good that is difficult to make explicit in transfer and reproduction. To this regard, Foray distinguishes three forms of reproduction: the first is called “gestures and speech” which takes place during the relations between master and apprentice or teacher and learner and that Polanyi called “indefinable knowledge” or tradition; the second form is
the codification with a script to create a model; the last form is an audio-visual recording of the action.

According to Foray, in the economic approach, knowledge is a “strange good” (p.91) with ambiguous properties that differ from the tangible goods and from private goods because of the social return in the production of knowledge and because it creates knowledge spillovers. These aspects are particularly important in an examination such as the one being carried out in this work, which aims at stressing the role played by Social Capabilities in an industrial district, where firm competitiveness depends on internal and external sources of knowledge in order to generate new knowledge and all firms benefit from knowledge externalities and knowledge spillovers if appropriability is high, the costs are low and the firms can produce more technological knowledge. Knowledge, in fact, is a non-excludable good (the first property), it is difficult to control privately because it is fluid and portable even if it is possible to keep it secret or that it belongs to an only owner. For a firm it is very difficult to control its knowledge that can be used freely by rivals because of the existence of knowledge spillovers or externalities (Foray, 2006, p.91-92). The literature on knowledge spillovers based on Marshallian externalities, distinguishes two types of externalities: the pecuniary externality that represents the Marshallian economies of specialization and the labour market economies and the technological externalities that represent the Marshallian knowledge spillovers (Breschi and Lissoni, 2001). It is necessary to specify that if Griliches (1979) focused his attention on technological spillovers worked out of the notion of technological externalities, Antonelli (2008a) explores the notion of knowledge pecuniary externalities and the possibility to identify positive and negative effects in term of appropriability of technological knowledge in relation to the cost and revenue. In fact if the pecuniary knowledge externalities are positive it can favor the generation of technological knowledge and appropriability, but it is possible that the agglomeration of firms has negative effects upon appropriability of knowledge (see Antonelli 2008b). Griliches (1979), instead, emphasized the positive effects of the non-appropriability of knowledge in terms of uncontrolled spillovers of knowledge. But in a competitive market, an organization or an agent cannot capture all knowledge spillovers; it depends on the absorptive capabilities (Cohen and Levinthal, 1989; Boschma and ter Wall, 2007).

The second property of knowledge is the non rivalry with two dimensions: the individual and collective ones. The first derives from using the same knowledge an infinite number of times without cost, the second derives from using the same knowledge by an infinite number of agents. It derives from the production of positive externalities and from knowledge producing activities without cost, even if these externalities can be limited because of the problem to access or because of the good exhaustibility.
The third property is the cumulative one because it is possible to bear new ideas and new good. Tacit knowledge is also a good which creates the value of the intellectual asset for a firm or organization and for the individuals who have the knowledge. It represents a temporary source of intellectual capital. The exchange, diffusion and learning of tacit knowledge, if the agents want to share, is difficult and expensive and the firm remains dependent on who has this knowledge because as we have seen in Polanyi, not all tacit knowledge can be transmitted (Foray, 2006, p.92-98).

From a different prospective, Witt and al. (2007), emphasize the different characteristics of knowledge considering the state of the technologic knowledge. The different characteristics consist of its tacitness or overtness on one hand and its public or private good property on the other hand, even if for these economists the first distinction does not help us to solve the second problem because knowledge becomes economic relevant only if it is accessed and communicated (Witt and al., 2007, p.3). This depends on the individual “absorptive capacity”, differently from the firm or organization “absorptive capacity” of Cohen and Levinthal (1989). Considering that knowledge can be communicated directly by oral or visual transmissions (for example with a face to face contact) or indirectly by artefacts and that this communication can be intentionally or not - it can be intentionally when the communication occurs with intention; without intention when it is implicitly expressed by an action or by an artefact - they distinguish three different types of knowledge. The first is the codified or overt knowledge that can be acquired from the manuals for example, when “the characteristic of accessibility and intelligibility are decisive” (Witt and al., 2007, p.4). The second is the <<…non-codified, but, in principle codified knowledge>> that can be acquired through questions to experts and can be transmitted directly with a face to face interaction. The third is the tacit knowledge which is unconscious, it is in the human memory and it cannot be transmitted among the individual interactions or observational learning but it is necessary one’s own trial and error learning (Witt and al., 2007, p.6). Considering the second problem, in other words, if knowledge is a public or private good, Witt et al (2007) consider it a problem of the knowledge technology and it depends on how knowledge can be acquired, stored, used and communicated. So, if knowledge is exclusively stored in the memory of one individual, it can be considered a purely private good; if knowledge is acquired by other people that have an absorptive capacity <<…that allows them to acquire communicated or accessed knowledge and to exploit it without destroying it…>> (Witt et al., p.11) it can be considered a public good.
For our purposes, according to Foray we assume knowledge as a matter of cognitive capability and according to Howells, Nonaka and Takeuchi is an “intangible and dynamic human resource” that has its origins in information, but it is different from information. In fact knowledge is a gradual construction: through the information something new is captured, but to become knowledge it is necessary learning and network. Learning is personal, individual, network is collective. According to Witt et al. (2007), in fact, the non-codified knowledge, with the exclusion of the tacit knowledge, can be transmitted directly with the face to face interaction or network, on the contrary the tacit knowledge may be acquired with one’s own or individual learning. To this regard it is necessary to specify that learning is a process through which a person acquired the knowledge by his/her own experience and the success of learning consists of the acquisition of knowledge (Polanyi, 1962a, p.369).

For this reason for us knowledge is neither a public good -characterized by non-appropriability, non-excludability and spilling over freely -, nor it is a proprietary good (Nelson and Winter, 1982), with higher levels of natural appropriability and exclusivity, nor an individual good because in isolation it has less value. It is more a collective good not appropriable (Martucci, 2006) because according to Metcalfe and Ramlogan (2005) it requires effort, time and high cost, it derives from the interaction of inductive and deductive processes and it grows in proportion to the quantity of the skills, the specializations, the groups’ relations, the individual absorption capabilities (Witt et al., 2007), the absorption capabilities generated elsewhere combined with the internal organizational capability (Lam, 2005), the dynamic capabilities (Teece and Pisano, 1997; Leoncini and Montresor, 2008), the collective capabilities (Lazonick, 2005) and the Social Capabilities. It can generate innovation according to the ability and capacity of relation and cooperation among people, firms and countries.

Particularly in our opinion time dimension is very important because it transforms knowledge from an excludable, private and rival good to an excludable but non-rival club good and in a long time to a non-excludable and non-rival public good. On the other hand, social knowledge and organization cannot exist without individual knowledge. In its strictest sense, when knowledge is tacit it is personal and individual and it is a proprietary or private good, when knowledge is codified it

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9 It is “...a process of gaining understanding that leads to the modification of performance, attitudes and behaviours through the acquisition of knowledge, skills and values, through study and experience” for Antonelli G. and Nosvelli (2008, p.108). They highlight how learning can consist of the acquisition of information, education, training and experience and they remark that different categories exist: general learning, vocational and specific learning and learning to learn.

10 The skill is both an art of doing and an art of knowing because the test and the taste is continuous and it can be transmitted only by example and not by precept (Polanyi, 1962a, p.54).
becomes a potential public good, but the individual knowledge can only grow through relationships with others, in a group, or in an organization such as a firm or with one’s own learning.

In other words, the tacit dimension is personal, specific and it cannot be totally communicated in a codified way. It is acquired through direct experience, trial and error and it is the result of a learning process acquired via informal behavior and procedures.

The accumulation of knowledge results from and depends on the capacity, ability or capability, skills, degree of perception, learning, experience and reasoning of an individual. In fact we are able to know what we know preliminary thanks to our genes, DNA (Chomsky, 1991) and to the human mind evolution and then to our learning, living and working environment. In this connection, Loasby (1999) recalls that the comparative advantage of the human mind is its capability to argue and to act, based on its evolution. Knowledge is not just logical thinking, a mental process (a priori), it is also the understanding of facts, experience, reasoning or learning (a posteriori). Knowledge combines learning and intelligence (Plotkin, 1994, p.181), it is based on conjecture and hypothesis and it is a human gift enabling man to solve problems (Popper, 1994).

Another important element of knowledge that is emphasised by literature, as we have just evidenced, is its relational characteristic, and its value which derives from learning by interaction and social networks. The greater is the relation among actors the more the actors develop a common language and ideas and the easier is to transfer knowledge. External inputs are one-off experiences for the human mind. It can happen at individual level and at system level, in a society where the collective knowledge11 is formed after a long time.

Another element of knowledge is its geographical context. The geographical context, where individual knowledge forms, is the geographical environment where the individual develops and grows. Knowledge is influenced by social, cultural and economic circumstances (Howells, 2002) and its development is influenced by human interactions. The organization change and adaptation are also influenced by external environment and technological change (see Lam, 2005).

2.4 The Role of Knowledge in Technology and Science

In this section, we focus our attention on technology and on its definition because the growth, the development and the firm performance depend on it and we are interested in its characteristic and in

11 Other theories based on organizational cognition that differs from the individual cognition and one’s own learning emphasise the social dimension, stresses the importance of collective learning and the importance of collective knowledge. In other words, the accumulation of knowledge is considered as a source of organizational capability. Bearing in mind this point of view the collective knowledge is the memory of the organization and "Collective knowledge exists between rather than within individuals. It can be more or less than the sum of the individuals’ knowledge…" (Lam, 2005, p.124-125).
the role of knowledge in technology and science because they are interconnected. We begin, in fact, considering that, as the knowledge, the technology is difficult to define and that we do not have clear the meaning of technology yet.

Technology seems to be a form of human creativity (De Liso, 2013), but it is studied from various perspectives and with different points of view.

Arthur (2009) in his work *The Nature of Technology*, considering that technology separates us from the Middle Ages, highlights how it creates our world, our wealth, our economy. Starting from the definition of the Oxford English Dictionary where it is considered “...the collection of mechanical arts that are available to a culture to make its economy and society function. The mechanical arts are the methods, practices and devices a culture uses to make things function” (Arthur, 2009, p.27), he gives three definition of technology: “The first and most basic one is that a technology is a means to fulfill a human purpose....a technology may be a method or process or device.... The second definition ...[sees] ....technologies as an assemblage of practices and components...with a plural usage....[In the third definition]...technology...[is seen] as the entire collection of devices and engineering practices available to a culture” (Arthur, 2009, p.28). Three principles spring: all technologies are combinations; each component is itself a technology in miniature and all technologies harness and exploit some effect. (Arthur, 2009, p.23). The new technologies are constructed mentally before physically and each technology represents a combination of components and these components are in turn technologies. Accordingly the new technologies can be used as components for others.

At the same time Arthur (2009) explores the connection between technology and science, and considers the first as an application and the second as a discovery. But technology is not a simply application of scientific knowledge, because technology uses science and it “...builds both from science and from its own experience” (Arthur, 2009, p.61). In other words, technology comes from theory and practical perception accumulated with experience. It is a practical knowing of how to do things that may not be fully expressible in words (Arthur, 2009, p.77-78). In this way science becomes part of technology and technology is in the science. Science, on the other side, uses technology and builds itself from technology. In other words they are strictly interdependent and co-evolve in a symbiotic relationship (Arthur, 2009, p.64).

In regard to knowledge in science and knowledge in technology, we have seen in the previous section 2.2, that different questions may create different forms of knowledge. For example the technology answers the following questions “Does it work?”, “Is it reliable?” and we learn how by practicing and often without the theory help (Ryle, 1949). The content of technology is
“knowledge-how”. The science answers the following questions “Why does it work?”, “What is the predictive power of my knowledge?” in other words, these questions can create in science the “know-why” and the “know-that”. The pure knowledge is pure science or science is a type of knowledge which can be true or false, instead technology is applicable knowledge or in other words it is the applications of some empirical knowledge (Polanyi, 1962a). Consequently <<Technology teaches action>> (Polanyi, 1962a, p.176) and <<The exact sciences are a set of formulae which have a bearing on experience>> (Polanyi, 1962a, p.49). The difference between scientific knowledge and technological knowledge leads to the distinction between discovery and invention, where the first makes an addition to our knowledge of nature, the latter establishes a new principle, but for both of them originality is important (Polanyi, 1962a, p.177).

But it does not exist a specific boarder-line because it is possible that exists some “know-how” in science and some “know-why” and “know-that” in technology (De Liso and Leoncini, 2011). It is possible an interaction between science and technology when technology is the application of pure science to practical problems and the technical process is an application of scientific knowledge and empirical technology gives material for scientific study (Polanyi, 1962a, p.179).

<<So we should not be surprised that science is rarely an adequate guide to the development of the technology which it might seem to suggest, or even that the technological implications of a scientific theory may not be recognized until long after the theory has become textbook material>> (Loasby, 1998a, p.156).

A difference between scientific and technological knowledge consists of the different roles played in trials and errors. In fact the “know-how” emerges from trials and errors rather than from logical deduction and what is really important is always the following trial (Loasby, 1998a). Another difference consists of the emergence of new knowledge, because in technology the efforts are aimed at building the so-called “bridging technologies” and the previous investments are not forgotten, while in science new knowledge means a new theory which exceeds the existing (De Liso and Leoncini, 2011, p.15; De Liso, 2013, p.16). Differences in the incentives characterize the technological and “pure” scientific knowledge; the first is characterized by economic incentives that are non-economic publications and the second by recognitions for problem-solving.

It is possible, as happened in the industrial district and more specifically in the wedding district, as we see in the empirical part, that an art cannot be specified in detail because it exists <<…the manner of an art without any clear knowledge of the constituent detailed operations>> (Polanyi,
1962a, p.52). This “indefinable knowledge” or tradition is still an essential part of the technology and it cannot be transmitted through rules, but only through apprentice. In this case, the personal contacts are essential and this tradition is often localized. In this case, Polanyi observed, this assimilation regards the only person that imitates another and the apprentice unconsciously picks up the rules of the art and these rules are not explicit known to the master. Institutions and social regulations can facilitate the efficient production, creation, use and dissemination of knowledge (Foray, 2006, p.18 and p.21).

2.5 From Personal to Social, Organizational and Inter-Organizational Knowledge

In this section, we arrive at the core of the chapter because the discussion is focused both on the transfer and diffusion of knowledge and on its transformation from personal knowledge to social knowledge as well as from organizational knowledge to inter-organizational knowledge. The purpose is in fact to explain how the new knowledge that derives from an individual can transform into an organizational knowledge or, in other words, how does personal knowledge become social knowledge and how does firm knowledge become district knowledge?

As we have said and according to Nelson & Winter (1982), Nonaka (1994), Nonaka & Takeuchi (1995), Grant (1996), Spender (1996a), Howells (2002) and Belussi et al. (2008) it is not only individuals that are able to create and diffuse knowledge. It is necessary to distinguish between individual knowledge or personal knowledge, and social knowledge or group knowledge, which Metcalfe and Ramlogan, (2005) call “understanding”, organizational knowledge and inter-organizational knowledge. However, organizational knowledge cannot exist without individuals even if the collective knowledge exists among individuals and it is the sum of individuals’ knowledge (Lam, 2005). In fact, at the beginning, the individual knowledge is private, it is in the mind of the individual, the ideas are formed in the mind of individuals (Nonaka, 1994) and it is difficult to transfer because it derives from perceptions, memory, inferences and experience together with reason (Metcalfe and Ramlogan, 2005, p.657) or it derives from the subjective “Image” of the world (see before Boulding, 1956). This personal knowledge is not the same, but more different types of knowledge of the same object can exist; it depends on the conceptual system (Putnam, 1993). Starting from the assumption that the development of new ideas derives from interaction among individuals (Nonaka, 1994), that individual knowledge is scarce and incomplete and the organization enhances individual’s diversity encouraging processes of learning by interacting (Belussi et al., 2008, p.183), when individuals interact within the same geographical or local space or context, using a common language, personal knowledge is increased and it becomes
interdependent. It becomes social knowledge which is collective, and it derives from individual interactions. These interactions or ties can be strong and/or weak as well as a bridge or a structural hole (Granovetter, 1973; Powell and Grodal 2005; Burt, 1992)\(^\text{12}\) (Outline 2). Through this social interactions knowledge is shared and developed (Nonaka, 1994).

**Outline 2 – From Personal Knowledge to Social Knowledge**

With a social networks personal knowledge can be transmitted within a group to become social knowledge

People socialise through meetings, in the street, in a pub, at school, at the cinema, in clubs, in the family, at university, during workshops, in institutions, firms and so on. In other words, people meet within organizations that may be political, economic or social, and exchange ideas, information and experience. Factors that induce members of an organization to share their knowledge include their individual standing within the organization, or their role (Cappellin, 2001). For example, a firm in terms of its internal structure and its organization, can be considered to be a social system or knowledge system (Tsoukas, 1996), through which workers exchange ideas, opinions, information, experience, knowledge and innovation. It is necessary to specify that firms and organizations have no self-knowledge in the direct sense. Knowledge can be shared within the firm, among customers and managers, managers and employees or managers and buyers, who together help to create new knowledge and innovation as the empirical part of this study highlights. Considering that individual knowledge is scarce and incomplete, the organisation could <<…valorise employees’ diversity, encouraging processes of learning by interaction>> (Belussi et al., 2008, p.183) or collective learning that requires the integration of the work of employees into organization (Lazonick, 2005).

\(^{12}\) For Granovetter (1973) the strength of a tie is a combination of the amount of time, the emotional intensity, the intimacy and the reciprocal services which characterize the tie (p.1361). For Powell and Grodal (2005) <<…a strong tie is a person with whom you interact on a regular basis, while a weak tie is an acquaintance or a friend to friends>> (p.61). The strong ties are importance for social support, are based on common interest and a lot of information reinforces the existing, are more cohesive, more effective particularly with the complex information; the weak ties are important for the new information, new ideas that a person receives <<…have a longer reach, but a much narrow bandwidth…>> (p.61). The differences among networks as bridges and structural holes are remarked, where the first are points of connection, the links that make weak ties possible, the latter are potential connections among units that are not connected.
At the same time as we have specified in sections 2.2 and 2.4, the firm facilitates tacit knowledge acquisition through learning by doing (Penrose, 1959; Arrow, 1962), learning by using (Rosenberg, 1982), learning by interacting (Lundvall, 1992) and through tradition (Polanyi, 1962a).

The importance of knowledge as a resource to be used by the firm and the industrial district is acknowledged in the classical and neoclassical economic literature.

In neoclassical theory the firm is regarded as a “black box” (Rosenberg, 1982), a simple efficient input-combiner (Foss, 1996); on the contrary in evolutionary theory the firm is a place where it is possible to make decisions based on its know-how (Loasby, 1999), organization (Coase, 1937), human and physical resources (Penrose, 1959, 1985), particular bundle of capabilities (Foss, 1996) and

<<…the firm is seen in its capability to coordinate learning processes where: the key resource is knowledge; the key productive process is learning; learning by interacting becomes crucial, side by side with the traditional forms of formal and informal learning; learning is a process embedded in the social and institutional context; knowledge bits are incorporated both in individual and collective agents>> (Antonelli G. and Nosvelli, 2008, p.109).

In the evolutionary approach, the firm introduces change to increase technological opportunities and learns how to adapt to change. In other words, learning and dynamics become a unique process, while the capabilities to innovate and those to absorb innovation are called the “dynamic capabilities” of the firm (Leoncini and Montresor, 2008, p.17-18). While all organization can learn and create knowledge, their innovation capabilities are different. (Lam, 2005).

In reality the importance of knowledge defined by Marshall as <<…our most powerful engine of production…>> (Marshall, 1920, p.138), in the structural organization of the firm was just described by Marshall (1867) in Ye Machine, where he proposes an analogy between the functional process of the mind and the structural organization of the firm. The last such as the first is formed by difference levels: the decision level where decision, after the first time, is codified and is transferred to the executive level. At this point it is transformed into routines that are adapted to different situations.

The route to a new way of conceiving the firm, founded on the resource-based theory, is attributed to Penrose (1959). When referring to the workers in a firm, Penrose points out the importance of experience (learning by doing), the codified and transmissible knowledge and focuses on the
resources that one firm owns. However, she does not elaborate a discussion on how and why this knowledge is transmitted and accumulated within the firm.

The ability of firms to scan and develop their knowledge is influenced by the size of the firm, its experience, its research activity, its knowledge capacity, its ties, its absorptive capabilities, its dynamic capabilities and location. A firm knowledge is not completely observable because it is intangible and we can only observe the tangible aspects of it, such as rules, technologies and customer data banks. Kogut and Zander (1997), analysing the knowledge of the firm, distinguish between information and know-how. The first can be transmitted without loss of integrity; it includes facts, propositions and symbols and implies knowing what something means. The second is the accumulated skills or experts that allow one to do something smoothly and efficiently (von Hippel, 1988) and the know-how consists of a description of knowing how to do something. The transferability and imitability of a firm knowledge are influenced by several characteristics or dimensions (Rogers, 1983; Winter, 1987) such as codifiability and complexity. Codifiability is the ability of the firm to structure knowledge into a set of rules and relationships that can be easily transmitted. Complexity refers to the number of operations required to solve a task or the number of parameters needed to define a system. Rogers (1983) and Winter (1987) explore how knowledge may be recombined through internal and external learning to form combinative capability; their presumption therefore is that the firm knowledge is socially constructed. Foss (1996), instead, considers the complexity, tacitness and specificity as characteristics of capabilities in which the tacit and social components of the firm knowledge are included.

At this point it is necessary to specify that for Howells (2002), firms and organizations have no self-knowledge in the direct sense. Knowledge can be shared within the firm among interpersonal networks and the organization and the internal structure of the firm form a social system where relationships are dependent on interpersonal ties as well as at inter organizational level (Powell and Grodal, 2005).

On the other hand, Nonaka’s theory of organizational knowledge creation that we develop better in Chapter 4 is based on the idea that organizational knowledge is created through a continuous interaction between tacit and explicit knowledge. He points out the importance of social interaction remembering the Polanyi’s tacit dimension and considers the innovation deriving from the organizational knowledge, "...a process in which the organization creates and defines problems and then actively develops new knowledge to solve them" (Nonaka, 1994, p.14).

13 For Foss (1996), capabilities (the term introduced by Richardson in 1972, but it is also present in Penrose (1985) constitute the knowledge base of the firm. Foss includes the evolutionary conceptualization of the firm presented in Nelson and Winter (1982) and the dynamic capabilities perspective introduced by Teece et al. in 1997.
Different is Barney’s point of view (1986, 1991) where organizational knowledge can be considered a competitive advantage, and it makes an important contribute to the firm success (Habeck et al, 2000) by acting as a strategy formulation. But the implication is that among firms it is information not knowledge that is transferred, enabling each firm to retain its competitive advantage. Knowledge becomes available through publication, patents, formal and informal ties (Powell and Grodal, 2005), informal networks, trade and goods as the empirical part demonstrates. It is possible that knowledge is transferred among partners that are part of an inter-firm cooperative arrangement or a strategic alliance (Collins and Hitt, 2006), research consortia, joint ventures, subcontracting, collaboration in R&D (Powell and Grodal, 2005).

Cooperation can reduce competition and networking can enable organizations to access complementary resources and capabilities. Multinational firms and outsourcing agreements are other important ways of transferring knowledge. But it is still difficult to transfer knowledge among firms (Kogut and Zander, 1997), and especially tacit knowledge, because one partner might choose to protect a particular innovation or a competitive advantage. In fact, when knowledge contains a large tacit dimension, not only the degree of transfer is not high, but the costs of transfer are high too. When knowledge is codified, the value is low, but the transfer is without cost (Richardson, 1972; Powell and Grodal, 2005). This suggests that exists \textit{a medium level of codified knowledge where the value of the innovative output exceeds the costs of knowledge transfer...} (p.76). Codified knowledge is more accessible, but its interpretation and assimilation is influenced by geographic space (Krugman, 1991). In fact according to Krugman (1991) when firms are spatially concentrated within a district, knowledge externalities will be more frequent and more knowledge-intensive. Thus concentrations of firms or spatial proximity have power and influence over knowledge interactions (Howells, 2002). Other studies, instead, consider that geographical proximity only is not sufficient to generate knowledge and learning, the role of social, economic, cultural and institutional proximity is also important (Amin and Cohender, 2004) as the geographical dispersion (Boschma and ter Wal, 2007). Consequently, as we better develop in the empirical part, elements of proximity must be integrated with geographical dispersion. Consequently, in our opinion, it is true that local relations, firm relations and the circulation of workers among firms, as it happens in an industrial district, can facilitate the circulation of information and knowledge. These local relations are an important source for exchange knowledge and transform organizational or firm knowledge into inter-organizational or industrial knowledge within a particular geographic space (Outline 3), but, for the survival of an industrial district, the “geographical openness” (Boschma and ter Wal, 2007) or, in other words, the external relations are also important because through them it is possible to capture and disseminate new ideas and
knowledge within the district through positive spillovers as the two case studies in the empirical part of this work, prove. Kogut and Zander (1997) call this inter-organizational knowledge, network knowledge; we name it industrial district knowledge.

**Outline 3 - From Firm Knowledge to District Knowledge**

Through firm network knowledge can be transmitted within a district

The exchange of information/knowledge, however, will be dependent on the types of relationships that are established. Where there is a horizontal integration among enterprises producing similar goods, the relationship will be competitive and information and knowledge exchange will not occur. Where integration is vertical involving enterprises producing complementary goods, the relationships will be cooperative and enable the easy exchange of information and knowledge.

In a district, social networks form more easily and stimulate transfers of information, knowledge and inputs that transform into new knowledge depending on the social abilities or Social Capabilities of the district. Within these networks, the diffused knowledge and information is promoted by the learning processes related to the work, staff qualifications and skills, investment in research and development (R&D), openness to technological cooperation, cooperation among workers and firms, mobility of labour, collaboration and work culture. The creation and diffusion of knowledge in a district depends also on confidence and trust among the members of the district, on learning processes based on imitation, on inter-organizational relationships or ties, resources sharing (Powell and Grodal, 2005) and on the interactions among agents with different levels of knowledge and competence (Cappellin, 2001). Much of the relational or network analysis literature (Powell, 1990) describes the dynamics of the connections among enterprises (unity) through the nodes and lines that connect them. This literature not only allows to furnish a representation of

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14 This notion of inter-organizational knowledge derives from the notion of inter-organizational network. This is possible because the notion of network is vast and characterizes set of ties and nodes. Consequently, the notion of inter organizational network can be applied to a variety of relationship among organizations as strategic alliances, joint ventures and industrial districts (Ebers, 1999, p.15)

15 To this regard see note number 2

16 Networks can be complex: they involve neither the criteria of the market, nor the paternalism of the hierarchy. In network forms, individual units exist not by themselves, but in relation to other units and the basic assumption of network relationship is that one party is dependent on resources controlled by another. (Powell, 1990 p. 303)
network and the different kinds of relation inside or outside the same net at national and/or international level, but it involves quantitative and qualitative analysis of parameters such as: the node and connection number, the object of the relationships, the nature of the relationships, the network characteristic and the network typology.

Knowledge networks facilitate the coordination and the integration of heterogeneous knowledge in contexts characterized by complexity, high uncertainty and numerous sources of knowledge. The capabilities to share tacit knowledge among all the nodes become one of the sources of competitive advantage for the district (Pilotti, 1999). In fact in the innovation literature it is found that in isolation a firm does not innovate, but it depends on the interaction with its environment, including networks (Fagerberg, 2005) and network of firms, institution, research centres, social organization (Lam, 2005).

It is important in this context to remember the role played by information and communication technologies (ICT) in the transmission of information and knowledge among individuals, within and among enterprises, and within a district.

2.6 Innovation and Knowledge

In this section we would consider what innovation is (Schumpeter, 1971, 1977; Dussauge et al. 1992; Tushman and O’Reilly, 1997; Hauschildt, 1997; Tether et al., 2005; Utterback and Abernathy, 1975, 1978, Fagerberg, 2005; Thomond and Lettice, 2002; Sirilli, 2010; Arthur, 2009) and its role with knowledge. This section is also very important for the empirical part when we estimate an innovation equation (section 8.7).

The literature of innovation is large and we start with the difference between invention and innovation and with the different typologies of innovation.

Schumpeter (1977) has pointed out the difference between invention and innovation, being the latter dependent from the former, and identified the different innovation route taken by small and large enterprises. In 19th century capitalism, the single entrepreneur earned market shares thanks to his own ability to innovate products, production processes and marketing strategies. This is possible only in a market without barriers to entry and, therefore, with a structural configuration in which perfect information and production fragmentation prevails. Otherwise, if the research contributes to innovation, the value derivable from it cannot be ensured without the entrepreneur’s initiative as the distinction between invention and innovation makes clear. Consequently, if the enterprise allows its
competitors to prevail in the innovation of products/processes or in the marketing, it creates neither more added value for the consumers nor it reaches competitive advantages.

So, if we believe that business is the engine of innovation, it is not feasible for it to invest in R&D if technical progress is a public good characterized by non-rivalry and non-exclusiveness. If knowledge is considered to be a public good, the idea that technology is like “manna from heaven” is a logical consequence of the neoclassical model. In this context, technology or any other form of knowledge is not an economic problem; a firm does not make an investment in R&D and thus it allows “*any item of knowledge [to] be used any number of times by any number of firms to produce any quantum of output or indeed to develop new knowledge*” (Metcalfe, 2001, p.18). If knowledge is not considered as a public good, but rather as a collective or club good, as we consider it, technology is not appropriable and the productivity process generates learning. This is one element of knowledge and it is important for the growth of knowledge. However, the essence of technology and innovation is knowledge (Nelson and Winter, 1982), the innovation can be seen as the outcome of the process of knowledge creation (Nonaka and Takeuchi, 1995) and at the same time a growth in knowledge is increased by technological change.

The firm can be considered the centre that governs the knowledge permitting to produce and spread technology. The firm is the organization where the technological knowledge is produced through a learning integration process and formal research. It is for this reason the place of specific competences.

According to Fagerberg (2005) << *Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry out into practice....Sometimes invention and innovation are closely linked...In many cases...there is a considerable time lag between the two*>> (p.4-5). They are in a continuous process and the time period often does not coincide. The firm makes innovation and in order to transform invention in innovation the firm needs to combine knowledge, capabilities, skills and resources.

According to Schumpeter (1971, 1977), innovation is a process of creative destruction or a “new combinations” of existing resources, involving the introduction of new goods and/or new production process to create a new organization or a new trade. According to Schumpeter, the changes that lead to the development are the introduction of a new good or a new production method, not necessarily based on a scientific discovery, but consisting, for example, in the determination of a new form of marketing or in the access to a new supply source of raw or semi-finished materials or, still, in a new industrial organization. This technological change concerns not only the firms and the users, respectively as technology sellers and buyers, but also public institutions; each of them contributes to the technological changes with their experience.
According to Tushman and O’Reilly (1997) innovation refers to the introduction of change in organizations from a strategic perspective and can be related to changing management practices or general structures. For Hauschildt (1997), however, innovation is something new - a new product, process, type of contract, means of distribution, marketing slogan, corporate identity or new individual way of working (Tether et al., 2005). Utterback and Abernathy (1975, 1978) distinguish among product innovation, process innovation and market and design innovation. Product innovation consists of delivering a new product or service to the customer. Process innovation refers to optimizing processes (to minimize costs or to increase quality). Design innovation is a “new product process” (Cooper, 1999) that creates a real change. Market innovations try to create new markets for new products. Consequently innovation is an introduction of change in a product, process or organization and can be incremental or radical (Thomond and Lettice, 2002), material or immaterial (Sirilli, 2010). Incremental innovation introduces minor improvements to existing products and often reinforces existing firms. It is also cumulative. Radical innovation is a discontinuous event; it is a little revolution deriving from a deliberate research and can create difficulties for existing firms. The distinction between radical or incremental innovation has different consequences for the firm. The first tends to reinforce the capabilities of established organizations, while the second provides the organization with a new set of problems (Dussauge et al., 1992). Material innovation is involved in the project investment in the purchase of new machinery; immaterial innovation refers to intangible goods which can be used for many years, for example investment in R&D, education, training or software (Sirilli, 2010).

There are others types of innovation, one regarding SMEs operating in the traditional sectors as it is our case study- defined as “Schumpeter Mark I” - and another – defined as “Schumpeter Mark II” – which regards large enterprises in advanced sectors. Schumpeter Mark I industries are characterized by low entry barriers, higher rates of firm entry; innovations are generated and developed by new firms with new ideas, new products and new process. The technological competition among firms assumes the form of creative destruction (Schumpeter, 1911). Schumpeter Mark II industries are characterized by high entry barriers (Schumpeter, 1950), high economy of scope and scale, high investment in R&D. In this case industrial technological competition assumes the form of “creative accumulation” with firms introducing innovations by means of a process of progressive consolidation of their technological capabilities along well established technological paths (Malerba, 2005, p.382). High technological opportunities, low appropriability and low cumulativeness characterize Schumpeter Mark I, while Schumpeter Mark II is characterized by high appropriability and cumulativeness.
In this way, if innovation depends on the level, the variety and the pervasiveness of knowledge, then effectiveness of innovation and its ability to give monopoly to the firms will be positively proportional to the level of knowledge appropriability, and negatively proportional to the degree of externality within the industrial sector. Time, as we know, decreases monopoly power, allowing the potential for imitation. Consequently, the firm requires constant innovative actions to increase its competitiveness and maintain its market share. A process of knowledge accumulation that produces innovation is necessary (de Felice et al., 2012).

In his analysis of innovation, Schumpeter stressed the tendency of innovation diffusion into district in certain industries and time period with consequently effect of growth (Schumpeter, 1939), implementing changes in production and demand, organization and establishment. Thus, we can say that the capacity of accumulation of knowledge in a firm produces innovation that is strictly connected to the acquired competences and, above all, to those acquired through the research. In a specific industrial district, the accumulation of knowledge and the innovation depend on the low level of knowledge appropriability and on inter firm relations. This is the key to strengthen knowledge commutability in a local context, where the firms can take advantage of localized externalities and geographic proximity/openness. The innovation and its different typology depend on the tacit knowledge and on social and firm networks; on the contrary, the codified knowledge depends on a formal communication or formal connection such as patents or licenses.

This means that a higher degree of knowledge appropriability is positively correlated with a higher degree of monopoly power, a higher concentration of production activities, and little possibility of knowledge diffusion, which can be regarded as a private property of the firm. On the contrary, a low grade of knowledge appropriability results in a higher fragmentation of the production activities, and in a higher imitation capacity and higher possibility of creating a continuous process of knowledge diffusion with a consequent increase of the innovation. The low grade of knowledge appropriability differs from the higher degree of knowledge appropriability since there is a good chance for the entry of new innovator entrepreneurs who, making use of the skills available in the sectors in which they operate, allow the whole production system to keep the market shares steady and to acquire new ones. If knowledge remains patrimony of few, who would benefit from it more than others, differences of growth and development would grow wider. For this reason, it is important that each country, both economically advanced and underdeveloped ones, employs Schumpeter’s model of innovation and learning. In fact, only when we recognise the importance of life-long learning, we can carry out indigenous growth and self-sustained/sustainable development.
If in the traditional literature, like in Schumpeter, the innovation is considered the theory of entrepreneurial behaviour and consequently the knowledge theory is focused on the individual, in the recent innovation literature the importance of innovation in the organization is emphasised – this important aspect was considered by Nelson and Winter in 1982 in the organizational memory of the firm- and the importance of routine reproduced through practice and how knowledge operates at organizational level (Fagerberg, 2005). Consequently, the firm in isolation can surely innovate, but within districts, innovation, technical progress and capital accumulation determine a mayor and rapidly increase in performance, productivity and development. Technical progress for example can be derived from common management of the processes of production. Considering the social and institutional implication of an innovation project for the analysis of the diffusion of new technologies is also important as well as considering the “openness” to new ideas and solutions. Consequently the firm and districts are able to interact and to learn with external sources and these implement the firm innovation and the district innovation. In this way, new ideas, skills, resources and capabilities are combined with the existing ones to produce a new innovation. This implication is particularly important for the smaller firms – and it is also true for the large firms (Fagerberg, 2005) - which must compensate the small internal resources with their openness to external resources, implementing the capacity of absorbing knowledge from outside or the “absorptive capacity”, and implementing the Social Capabilities.

2.7 Conclusion

The core of this chapter, as we have seen, is devoted to the knowledge transmission and transformation from the individual knowledge to the social one, and from the organizational or firm knowledge to the inter-organizational or district one. But in order to reach this fundamental point, that we analyse in Chapter 4 when we focus our attention on Nonaka and Takeuchi ’s model applied to the industrial district, we have started with a discussion about the complexity of the knowledge nature and highlighted the different visions that it is possible to find in literature. This is based on the different context and perspective (philosophers, scientists, logical, pragmatist). As we have emphasized, our point of view is as economists such as our definition of knowledge reduces it to an economic good and it is a matter of cognitive capability. Considering our economic prospective, we have focused our attention on the different dimensions, properties of knowledge and on its relationship with science, technology and innovation. As we have remembered, one consequence is the following: if knowledge is considered to be a public good, the idea that technology is like “manna from heaven” is a logical consequence of the neoclassical model. In this context,
technology or any other form of knowledge is not an economic problem. If knowledge is not considered a public good, but rather a collective or club good then technology is not easily appropriable and productivity process generates learning. Technology becomes the crucial factor for the competitiveness of firms and of a country. At the same time the essence of technology and of innovation is knowledge. The former depends on the degree of cumulativeness, and appropriability, represented by the capacity of new knowledge to generate further new knowledge and innovation. The greater the degree of appropriability of knowledge, the smaller becomes the capacity of its diffusion in a district and its growth. A higher level of knowledge corresponds to a higher degree of innovation.

The different dimensions of knowledge and particularly the tacit one in an industrial district and in this work, forms, in fact, a crucial element in the Social Capability concept that is associated with the enlarging knowledge learning processes and network diffusion as we explain better in Chapter 3, where we focus our attention on Social Capability concept. Consequently in the empirical part of this work, we verify the relationship among agents for knowledge diffusion in our case study and we test, with an innovation equation presented in Chapter 8, if in our special industrial district, a higher degree of innovation corresponds to a higher level of knowledge and Social Capabilities.

In fact in a district, social networks and firm networks form more easily stimulating transfers of information and inputs, which in turn generate new knowledge to an extent determined by the firm capabilities and Social Capabilities. We refer to Chapter 4 for the conceptual model of knowledge creation and diffusion in the industrial district. In fact to explain how knowledge and innovation are created and diffused in the industrial district we refer to Nonaka and Takeuchi’s model.
CHAPTER 3

THEORETICAL ASPECTS OF SOCIAL CAPABILITIES

3.1 Introduction

As we have just pointed out in the previous chapter, the different dimensions of knowledge and particularly of the tacit one in an industrial district, and in this work, form a crucial element in the Social Capability concept.

The aim of this chapter is to outline the key role that Social Capabilities play in the transfer and diffusion of knowledge and tacit knowledge in the industrial district and for the creation and the diffusion of new knowledge and innovation.

A peculiarity of knowledge, considered in the previous chapter 2, bases, in fact, on Social Capabilities or social abilities to increase the process of knowledge accumulation and network enlargement. This latter is a fundamental modality to diffuse knowledge and innovation through Social Capabilities. Social Capabilities and knowledge, in fact, in this work, represent the key variables to understand recent changes in structure, innovation and competitiveness of an industrial district. Any industrial district is characterized by specific Social Capabilities that differ from social capital and we stress this aspect in Box 1 of this chapter in order not to create confusion.

Particularly, in this chapter, we want to start from the capability concept (Richardson in 1972; Penrose, 1959, 1985; Foss, 1996; Loasby, 1998a, 1998b) and dynamic capability concept (Teece, Pisano and Shuen, 1997; Leoncini and Montresor, 2008) to arrive at the Social Capabilities (section 3.2).

We highlight the use of Abramovitz’s Social Capabilities (1989) to explain the results of a long-term economic growth of different nations (section 3.3) and after we apply this concept to the growth and the performance of the industrial district.

We propose a definition of Social Capabilities in the industrial district (3.4) and analyse the role of knowledge in shaping Social Capabilities (3.4.3). As a matter of fact, the definition of Social Capabilities adopted in this work is wider than the one used by either Abramovitz (1989) or Ohkawa-Rosovsky (1973), since it is integrated with Marshall (1890), Penrose (1959, 1985) and Becattini’s notions (1981). It is associated in enlarging the knowledge-learning process and network diffusion and it plays a key role in the transfer and diffusion of knowledge and tacit knowledge within an industrial district.
Taking into account these aspects, we identify the characteristics and elements of the Social Capabilities in the literature and referred to an industrial district (section 3.5). The discussion in section 3.6 is focused on the relationship between Social Capabilities and innovation in the industrial district too. We show how the innovation, generated by knowledge and by Social Capabilities and interactions, brings changes in the competitive dynamics of industrial district and how knowledge, Social Capabilities and innovation are the key variables to understand the recent structural changes in technical and organizational terms. The conclusion is in section 3.7.

3.2 From the Capability Concept to the Social Capability Concept

In order to develop a rigorous analysis of the notion of Social Capabilities it is necessary to go back to the historical origins and to its adoption in literature. But it is also important to better study the notion of capabilities that we have introduced in Chapter 2 to arrive at the Social Capabilities. In fact, the capability concept is utilized for the firm and its relations. The Social Capability concept is utilized, in this work, for the industrial district. It includes, at the same time, the social and firm dimension or the social and industrial networks. The set of relationships between the institutions and the individuals on the one hand and between the institutions and firms on the other has to be added to the industrial networks.

3.2.1 The Capability Concept

The start point is to consider the capability concept. For Foss (1996), the capabilities, a term introduced by Richardson in 1972, but which is also present in Penrose (1959, 1985), constitute the knowledge base of the firm. Foss includes the evolutionary conceptualization of the firm presented in Nelson and Winter (1982) and the dynamic capability perspective introduced by Teece in 1997. More specifically, for Foss, the tacit and social components of the firm knowledge are embodied in capabilities.

But, to present in detail our analysis of the capabilities it is necessary to start remembering that the evolutionary literature (Foss, 1996; Lombardi, 1997; De Liso, 1997; Belussi et al., 2008) agrees to
consider Penrose’s book *The Theory of the Growth of the Firm* (1959) as the foundation of the resource-based theory\(^\text{17}\) of the firm and for the capability definition.

In her theory, Penrose considers the firm not only in terms of its economic function – as buyer and organizer of resources to make products and services for the market – but she also highlights its role as a centre of physical and human resources. She emphasizes the role of human resources. Thus, in Penrose’s work, capabilities are associated with human resources inside the firm. However, they can also form outside the firm. Every firm owns tangible and intangible resources, which give each of them their unique character and provide a sustainable competitive advantage.

The capabilities are \(<<…a \text{ repository of assets, a pool of resources, the utilization of which is organized in an administrative framework}}>>\) (Penrose, 1959, p.149). They are a collection of physical and human resources that can be used in different ways (Penrose, 1985, p.7). For Penrose the competence of the firm is the sum of the different individual competences, and firm employees own knowledge that has the capacity to increase through *learning by doing* which we have taken into consideration in Chapter 2.

In *The Theory of the Growth of the Firm* (1959), the emphasis is on capabilities, while in *The Theory of the Growth of the Firm Twenty-Five Years After* (1985) she focuses on knowledge and also on collective knowledge.

Penrose, then, associates the term capabilities with the resources that include the knowledge of the firm and, more particularly, as Foss (1996) claimed, referring to Penrose, to the tacit and social dimension of knowledge.

With a different perspective, to construct a theory of industrial organization and to answer the question about the division of labour between the firm and the market, Richardson, in 1972, considers the organization, knowledge, experience and skill or appropriate capabilities on one side, and the dense network or inter-firms cooperation and affiliation on the other.

Influenced by Penrose, he also says that the firm, the production \(<<… \text{ has to be undertaken by human organizations embodying specifically appropriate experience and skill}}>>\) (Richardson, 1972, p.888). Consequently, the firm is not only a planned coordination, an island of planned coordination in a sea of market relations, and the market is not only a spontaneous coordination

\(^{17}\) The Resource-based theory focuses on the importance and characteristic of resources that one firm owns, resources that are difficult to imitate, but this theory does not consider why and how some firms have more valuable and inimitable resources rather than others (Lazonick, 2005).
because there is not dichotomy between firm and market (Richardson, 1972, p.883). Therefore, the planned coordination is not only of the single firm, but it may be through the cooperation of independent firms. The relationships created among firms must be integrated with the relationships with suppliers, customers, providers of services as it is emphasised by Marshall (1920). In this way, the internal capabilities are combined with external ones and this may happen in an industry as in an industrial district, but in this latter everything is not planned.

Famous is the Richardson’s sentence where he defines the industry

<<…as carrying out an indefinitely large number of activities related to the discovery and estimation of future wants, to research, development and design, to the execution and co-ordination of processes of physical transformation, the marketing of goods and so on. And we have to recognize that these activities have to be carried out by organization with appropriate capabilities, or, in other words, with appropriate knowledge, experience and skills. >> (Richardson, 1972, p.888).

The firms, therefore, found their comparative advantage and consequently their competitive advantage in their capabilities and they specialize in the activity that uses these capabilities. The specialization allows each person to learn more about particular group and to create new knowledge about them (Loasby, 1998b, p.164). This is valid for each firm and for the industrial district too.

It is important to note as remembered by Penrose (1959) and Richardson (1972), that the capabilities evolve with the firms and the firms grow for their capabilities.

In the previous and famous sentence of Richardson, the foundation of the capabilities theory of the firm is found: what any firm does, the evolution of the firm activity including knowledge and skills, the relationships with other firms (Loasby, 1998b, p.163).

Richardson also specifies that through a network of cooperation among firms, technology cannot be transferred to all firms with a simply licence or using a process because technology is not reducible to information, but it consists of experience and skills. These ones cannot be included in the transfer. However connections among firms, trading relationships, subcontracts, licences, relationships with suppliers help the exchange of capabilities, knowledge and technology as we have seen in Chapter 2. They help the development of product and process as it can be in the
clothing industry, which is our case study. Therefore we need to understand the performance of firms and of individual agent not limiting our attention to only “knowledge that”, but to the “knowledge how” too (Loasby, 1998b, p.166).

Loasby (1998b), in order to better analyse the concept of capabilities, develops and examines the capabilities from the perspective of knowledge. He identifies four kinds of knowledge and two dimensions. The first dimension is formed by “knowing that”18 and “knowing how”, the second dimension by direct and indirect knowledge. He identifies the capabilities in the know-how, direct and indirect, crucial for explaining the performance of a firm, an industry and an economy (Loasby, 1998a p.152 and Loasby, 1998b, p.165). Loasby’s distinction between “knowing that” and “knowing how”, as we have seen in Chapter 2, is comparable to Polanyi's distinction between codified knowledge and tacit knowledge.

In the recent literature and with a different perspective19, Teece, Pisano and Shuen emphasized <<…the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments.>> (Teece, Pisano and Shuen, 1997, p.524) referring to it as dynamic capabilities and they considered the firm as an open system. The firm performance depends on the dynamic exchange with the external environment (Leoncini and Montresor, 2008), on the firm relations with its environment and on its organization. The dynamic capabilities are subjected:

<<…to fine-tuning its capabilities set and its organizational structure in order to fit its competitive relationship with the outer environment. [and] On the other side, …to the capacity of the firm to shift its boundaries…>> (Leoncini and Montresor, 2008, p.34).

The firm in fact introduces change to increase technological opportunities and learns to adapt itself to the change. The capabilities increase through the learning that becomes the competitive factor for firms and the social dimension is emphasised through the importance of the social and collective learning process.

In a global market, where the industrial district is global and not only local, an open network obtains more advantage from external sources of knowledge. This opening district takes advantage

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18 “The knowing that “...is subdivided into “knowing what”” and “knowing why” (Loasby, 1998b, p.165).
19 For the different approach on the concept of dynamic capabilities see Montresor and Leoncini (2008).
and more performance from the embeddedness external knowledge, new resources and competences. This becomes possible thanks to the “absorptive capacity” of local firms (Cohen and Levinthal, 1990) or thanks to the capabilities to absorb external knowledge which is re-processed inside the system and combined with the internal knowledge to improve the innovative performance of the industrial district. In fact Boschma and ter Wal (2007) show how the innovative performance of the district depends on the higher absorptive capacity and on better connections.

This continuous conversion process of knowledge that we better analyse in Chapter 4 and the crucial role of exchange of knowledge in the industrial district is one of the reasons why our survey focuses on source of knowledge among firms, foreign firms, trade fairs, national and international markets, commercial agents, internal and external suppliers, internal and external clients, institutions, associations, conferences, specialized magazines.

3.2.2 The Social Capability Concept

As we have seen, if the capability concept is utilized for the firm and its network or for the inter-firm cooperation and relationship, the Social Capability concept is utilized, in this work, for the industrial district. In fact, the peculiarity of the knowledge approach, which is used here, consists of the social abilities to enlarge knowledge learning process and network diffusion that we call Social Capabilities.

It is necessary to precise that the concept of “Social Capabilities” is not used univocally in literature, even if this terminological confusion is not also a conceptual ambiguity. It is sometimes meant as a level of cooperation, local culture, collective resource deriving from a net of relationships which are created among individuals, so as to be assimilated to a “social capital” (we consider the difference between Social Capabilities and social capital in Box 1). While it is sometimes meant as a residual indicator²⁰, a fifth intangible factor which is usually used to explain the growth processes of a nation, or, as in this research, of an industrial district.

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²⁰ A Statistic Residual is the component of the economic growth of a Country which is not explained with the increasing of the factor use. The models of endogenous growth do not assume that the physical capital is the only determining factor in explaining the economic growth or the different growth levels among the Countries. The growth trends, for these models, do not depend on the decreasing return of every factor and specifically of the labour and capital factor, but also on the technology and on the dynamical relationships that can be developed. Finally the long-term per capita growth trends cannot be explained only by the exogenous technological changes or by all that is included in the “Solow residual”, as it is the case of the neoclassical models, but by all those factors which can be attributed to this residual, as the effects of education, technology, organisation, research and development, culture, etc. (see Cypher and Dietz, 1997).
In 1989 Abramovitz strictly defined it, explaining the results of a long-term economic growth of different nations thanks to the natural resources, the "technological congruence" and the Social Capabilities. In this latter, he distinguishes two fundamental components: the social attitude and the economic characteristics of the population and institutions. Meant as the whole of the institutional and social-economic conditions which govern the actions, the behaviours and the relationships among the agents of a nation, the Social Capabilities determine an interactive and cumulative process where the economic growth is supported and, at the same time, it favours the following strengthening.

In such a way, and contrary to the convergence theory, this process explains as the differential development of the poorest countries depends on the initial endowment of the “Social Capabilities”.

Starting from these considerations and adding the characteristics highlighted by Marshall and by Becattini to those highlighted by Abramovitz, Social Capabilities are thought to be able to explain the performance and the growth of an industrial district. Therefore all the practices and behaviours – which are often rooted in the history and in the society, in the political and social institutions, and then, in the temporal evolution of a system - are added to Abramovitz’s definition. They aim at stimulating both the capabilities to utilize the scientific potentialities, and the best technological practices imposed by the market. Since, then, in an industrial district, the enterprise is considered a centre to govern the common knowledge, to accumulate the knowledge and to generate and spread the technology. The industrial district is the place where the innovation is generated by the integration of Social Capabilities, knowledge learning processes and formal research; it is considered as a generator of knowledge, competence, skill, innovation and, therefore, of development.

To this regard, Abramovitz (1989), explaining the residual, affirms that almost the 90% of the US per capita growth can be ascribed to the increase of the factor total productivity, included in what is not measurable and definable, and that Solow (1957) called “Technical change”, which corresponds to the translations of the aggregate production function. Abramovitz called such a residual, deriving from calculation mistakes, “some sort of measure of our ignorance about the causes of economic growth” and it corresponds to the mysterious elements of the growth of the factor total productivity. Once the residual was discovered, the economists tried to measure its content. Therefore on the basis of Denison’s studies (1985) about the resources of the labour productivity growth in USA, Abramovitz distinguishes between the “Primitive Residual” and the “Final Residual”. The first represents the growth of the factor total productivity (in this case, of the labour factor), the latter, and even if quantitatively smaller, represents the most important resource of the growth given by the “advance of knowledge” and included in the production.

21 In order to explain the "technological congruence", Abramovitz (1989) refers to the most efficient appropriation of technology by the Countries followers, affected by the different endowment of the productive factors, by the dimension of the market and by the institutional and cultural factors.
Whether the concept of capabilities is used for just an enterprise or just a single individual, the concept of Social Capabilities refers to an industrial district, to a society, to its way of working and organising in a specific territorial context.\(^{22}\)

We could think that all the relationships - created between institutions and individuals on one hand, and between institutions and enterprises on the other hand - can be created through networks of firms and/or of individuals. The interventions of policy, which a political or social institution can carry out, favour the knowledge and learning acquisition and diffusion and all this is shown above all in an industrial district, where the geographical proximity among the firms favours the diffusion of knowledge and innovation through the Social Capabilities. But if this latter characteristic can be true for the traditional and Marshallian industrial district, it is not true for the modern industrial district that is in continuous evolution and where local actors mix internal knowledge with external knowledge. In fact, the geographical proximity alone is not sufficient to generate learning and knowledge (Maskell and Malmberg, 1999; Amin and Cohendet, 2004). For the survival of an industrial district economists considered the “geographical openness” (Giuliani, 2005; Boschma and ter Wal, 2007) or, in other words, the external relations through which it is possible to capture and disseminate new ideas and knowledge within the district through positive spillovers (as we have considered in Chapter 2).

Starting from this analysis, from the term definition and origins, as well as from the most recent interpretations, the attention moves to a series of empiric works, among those the one by Ho Koo (1995) and the other by Temple and Johnson (1998) who tried to specifically identify and measure the Social Capabilities. But, because their residual and intangible feature, the debates arisen in literature about this are still open and heated. Ho Koo (1995), following Abramovitz, studies the Social Capabilities with refer to the industrialization and economic growth of Korea. In this case he describes the Social Capabilities that include the social factors as its economic policies and the characteristics of its workers, firms and government\(^{23}\). Temple and Johnson (1998), starting from the Adelman-Morris social development index based on the interrelation of economic and non-

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\(^{22}\) It is possible to refer the Social Capabilities to the cluster too because both derive from the Marshall’s notion of industrial agglomeration, but for the cluster notion is necessary to consider some hypothesis as the importance of the geographical proximity, even if it is not a well-defined term. See footnote 2 in Chapter 2.

\(^{23}\) Ho Koo (1995) considers three categories of social cultural factors: social value or “invisible” factors, education and formation of the human resources base and acquired pragmatism and secularism. The nature of government – political and social stability- is an important element to mobilize these elements. The sources of the competitive advantage of Korean firms are: an environment of competition, low cost of workers and managers, training, centralized organization government support for R&D. He adds the technological capabilities for the technological development in Korea (Ho Koo, 1995, p181-202).
economic forces\textsuperscript{24}, evidence how the Social Capabilities can be captured by the following five indicators. 1) The characteristic of the basic social organization measured through “…the dominance of the immediate family over the extended family or clan, and tribal allegiances” (Temple and Johnson 1998, p.976). 2) The extent of mass communication measured through the newspaper circulation and the radio number per person. 3) The extent of social mobility measured through the school enrolment data. 4) Modernization of outlook measured through social and political participation, voluntary organization, judgment and with the presence or not of cultural and ethnic barriers. 5) The importance of the indigenous middle class measured with the proportion of men employed in the professions and the greater role of expatriates in these professions.

They construct their Social Capability index based on the subsets of these five indicators. But in these empirical studies the Social Capability index is more a social indicator and it does not capture the economic performance. This indicator is not suitable for our Social Capabilities definition and it does not capture all the Social Capability characteristics to explain the growth of an industrial district. It is for this reason that in Chapter 8, we propose a measure of Social Capabilities and we determine the most significant indicators. This represents a contribution to the debate.

Considering the importance that the Social Capabilities take on in order to explain the long-term dynamics of the industrial district continuously in evolution, this work aims at examining also the processes of the district change based on the characteristics that literature ascribes to them (see Chapter 6), as to identify the Social Capabilities which characterise the districts that are object of our case studies (see Chapters 7 and 8).

We examine how another part of literature (Markusen, 1996; Guerri and Pietrobelli, 2004, 2006; Paniccia, 2005) - which often uses non-homogenous criteria, individualising different and new forms of agglomeration – is set against the mass industrial organisational model, typical of the Italian industry based on criteria generally followed by the literature about the district, from the end of the 70ies (Becattini, 1979, 1989, 2000; Brusco, 1989, 1991).

As we have already said, we start from Abramovitz’s notion of Social Capabilities and after we apply this concept to the performance of the industrial district. For this reason, in this research, the definition of Social Capabilities adopted is wider than the one used by either Abramovitz (1989) or Ohkawa-Rosovsky (1973), since it is integrated with Marshall (1890), Penrose (1959, 1985) and Becattini’s (1981) notions. It is in fact associated with enlarging the knowledge-learning process

\textsuperscript{24} In the construction of the index, Adelman and Morris (1967) consider 41 social, political and economic indicators for 74 developing countries for the period 1957-62. But in the final version of the index they considered a factor analysis of per capita GNP and 22 social and political variables. See Adelman and Morris (1967) work for the variables.
and network diffusion and it plays a key role in the transfer and diffusion of tacit knowledge within an industrial district.

### 3.3 Social Capabilities in Abramovitz

In order to arrive at our Social Capabilities definition, we start with Abramovitz’s 1989 fundamental work “Thinking about Growth” because if Richardson together with Penrose is considered the founder of capabilities, Abramovitz is the founder of the Social Capabilities.

Abramovitz starts remembering how the interest for the economic growth has been studied since Smith, in the “Wealth of Nations”, where he evoked the theory of the development, which was then refined by Malthus (1798) and Ricardo (1826), sharpening the conflict between population and resources. Abramovitz thinks how the idea that the progress was based on knowledge was increasing at that time and how the possibility for the human beings to increase and improve the race was perceived more and more. He was initially much influenced by the neoclassical convergence theory and particularly by the elements that it considers necessary to start a growth process: institutions, population and technology but he moved away because the empirical results he obtained.

When Solow (1957), Kendrick (1956, 1961) and Abramovitz arrived, notwithstanding different studies, at qualitatively identical conclusions, Abramovitz writes:

<<Only a small fraction of U.S per capita growth over many decades could be attributed to total input growth per capita. Only a small fraction of labour productivity growth could be attributed to growth of capital per worker or per man hour. An overwhelmingly large fraction (approximately 90

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25 To this regard see Mill and the Economic Politic Principles (1848).
26 Abramovitz remembers that, at the end of XIX century, the fear which characterised Mill’s idea disappeared because of the industrialisation process which increased the productivity in agriculture and in manufacturing and, which, applied to the means of transportation, opened the way to conquer the foreign markets. The study about the economic growth started again after the World War II, because of the victory obtained thanks to the English and American technological advantages that succeeded in overwhelming the German aviation ones.
27 Kuznetz, Clark and other economists in measuring the national product of a nation were driven by the concept of production function and Mill himself thought that the production growth was the result of the growth of the same inputs or of their productivity. In many works, Kendrick and Solow aimed at studying the progress considering the knowledge as one of its main resources. The growth of the human capital through investments in a higher education, in on-the-job-training, in diet, in Research and Development together with the economies of scale and the better allocation of resources are considered the immeasurable components of progress.
percent) was due to the advance of total factor productivity, that is, to something whose contents were as yet unidentified and unmeasured>> (Abramovitz, 1989, p.14).

Solow (1957) calls this unknown factor “technical change”, showing that it corresponds to the translation of the production function. Abramovitz, indeed, affirms that the residual deriving from the calculating errors can be defined as <<some sort of measurement of our ignorance about the causes of the economic growth>> (Abramovitz, 1989, p.15) and it corresponds to the mysterious elements of the growth of the factor total productivity.

Discovered the residual and particularly the “Primitive Residual”\(^{28}\) and the “Final Residual”\(^{29}\) that can be considered the embryo of the Social Capabilities, the economists tried to measure the content. Denison’s Final Residual (1985) is considered a measure of the growth due to the advancing of knowledge incorporated in the production. Then the growth generates residuals, but the problem consists in measuring that part of the accumulated human capital or of immeasurable accumulated knowledge.

To this regard, Abramovitz remembers that, according to Denison, the education becomes fundamental to estimate the labour growth trend because, when the education is increased, the level of workers’ capabilities increases. But the literature, the numbers and the skills do not say anything about the technical and scientific training.

The education, however, according to Abramovitz has also a wider meaning than the one ascribed by Denison, as, because it improves the level of the workers’ tolerance, it makes them flexible to the moving from a country to another, from a region to another, for us from a district to another and influences the governor operations and objectives.

The education, therefore, according to Abramovitz, governs and leads the social climate of economic activity, making itself necessary for the economic growth of a country.

<<Education, in short, is one of the governors of the social climate of economic activity. >> (Abramovitz, 1989, p.22).

Analysing the Europe and Japan rapid growth after the war, Abramovitz believes that this was based on the effects combined of a technologically obsolete initial capital stock and new

\(^{28}\) The “Primitive Residual” is defined as the growth of the total productivity of the factor which includes the entire productivity growth of labour calculated in Denison’s estimate which Abramovitz refers to in the resources of labour productivity growth.

\(^{29}\) The “Final Residual”, though it is quantitatively smaller than the “Primitive Residual”, is the most important resource of the labour productivity growth in the post-war period, which Denison’s studies refer to.
capabilities. This rapid growth is made effective by using of the best technological practices incorporated through the capital accumulation and the relationships between the technical progress and the construction of the human capital, and through the education and the training. The cost of the new development or of technology depends, therefore, on the skilled workers (for example: engineers), the managers, the workers’ capabilities, the leaning of a new job and the routines. Considering the importance of these expects, in the empirical part of this work (Chapter 7), we discuss and measure the firm expenditure in learning and on skills in wedding dress district and baby clothing district as well as we distinguish general skill and specific skills (Becker, 1964)\textsuperscript{30}. The resources - such as the tangible capital accumulation, the human capital growth, by means of education, and the technological progresses, therefore - are not independent among them, but they interact each other. Abramovitz discovers that the knowledge advances, in a society, become the central nucleus of the growth process. The deepest causes that determine the economic growth are identified in the nation and in the historical determinants. Some economists, among whom Kuznetz (1930), identified the nation as the unit of study of the economic growth.

Analysing the institutional, political and social factors which the growth of a country depends on, or, better, the convergence of an underdeveloped country, or follower, with the industrialised countries, or leaders, is identified with the Social Capabilities meant as the social capability for growth. Such a concept, if it seems easy to express, is more complex to analyse in the different historical and market conditions.

In particular, in 1989, Abramovitz introduces a strict definition of Social Capabilities different from the one initially proposed by Ohkawa and Rosovsky (1973) during a discussion on the institutional development in Japan\textsuperscript{31}. He explains the long-term results of different nations thanks the natural resources, the <<technological congruence>> and the Social Capabilities. In these last he distinguishes two fundamental components: the attitudes and the economic characteristics of population and institutions, which are based more and more directly on the ability to utilize the modern technology.

\textsuperscript{30} Becker (1964) made a useful distinction between general and specific skills. General skills are defined as those which are also useful with other employers; specific skills increase the productivity of the worker only in his/her current job.

\textsuperscript{31} For Ohkawa and Rosovsky (1973), Social Capabilities refer to those factors constituting a country ability to introduce or engage in technological and organizational progress.
Identified as a residual element, they are defined as the ability of a country to utilize the scientific potential and the best technological practices imposed by the market and by the natural endowment.

The elements of Social Capabilities consist in an ability of a country to use the advanced technology that is a fundamental element in its productivity potential growth and on its capacity to acquire it in the first place. It is for this reason that in the survey we consider and measure the innovation introduced in our districts, identified with new product, processes or organizational methods, the new prototype number and the computer technology use.

One part of the Social Capabilities is identified with the technical competence of the country population, measured by the level of general education and by the share of the population with training in technical subjects. (Abramovitz, 1989, p.45).

According to Abramovitz, the growth of a country depends on the evolution of its economic, political, social and institutional conditions. He explains this statement considering that in order to understand the different elements of success or failures which characterise the growth of some countries, Abramovitz refers to the characteristics of a nation that he defines Social Capabilities. The characteristics he uses to distinguish the leader countries from the follower ones are: 1) the technology incorporated in the capital stock that results to be more obsolete, if it is compared with the apparition of better practices and with the leader country technology; 2) the relatively old capital of the poor countries, so that the leader country return investments should be higher in order to make the technological gap higher; 3) the agriculture prevalence and few sector differentiation in the underdeveloped countries.

He also includes among the Social Capabilities elements, other three technological characteristics of the modern production such as the scale intensity and specialisation, capital intensity, the expansion of the economic functions which require the development of skills, of knowledge, of experience, of institutions and of habitual behaviours.

Once defined the characteristics and identified the Social Capabilities elements, Abramovitz remarks that the effects depend on different causes. Some changes can require a very long time, others, on the contrary, only few generations. For example, in order to increase the labour force education level, it is necessary a very long time and many can be the resistances which delay the Social Capabilities effects such as the interests, the traditional relationships among the enterprises, the workers and the entrepreneurs. Once the Social
Capabilities are improved, according to Abramovitz, the countries can succeed in utilising fully their technological potentiality. With reduced traditional restrictions and with a high education the growth of a country can start. The convergence process, above mentioned, between followers and leaders, could occur, if only the latent knowledge, the practical knowledge and the technological gap exist. However, if the recovery process should cause an improvement of the Social Capabilities, the convergence process would never take place, because some countries could grow more slowly than others.

In basis of Abramovitz’s definition of Social Capabilities, these should grow in a linear way to face the opportunities presented by the technological potentials. But this is not always true, as the country adjustments to the opportunity and to the old technology use can limit their capability to explore new directions of technological progress, while the social climate and the political and social institutions are among the motives of the technological progress and the economic growth.

If, in his first studies, Abramovitz had identified the Social Capabilities with the technical competence, measured by the “education” proxy and with the political, commercial, industrial and financial institutions, qualitatively measured, then, he became aware that the Social Capabilities depend also on the technological opportunities and on the enterprise organization.

In 1996 Abramovitz and David included in the Social Capabilities the characteristics and the quality of the population and the organisations that influence the economic opportunities including those originated from political and social institutions. The crucial role of these latter is fundamental in our case study to share knowledge and to improve the district performance. It is one of this reasons why our survey focuses on relationships between district firms and political and social institutions.

The potentiality of a country depends on the combination between a technological gap and Social Capabilities whose main elements are: the easiness in spreading the knowledge (IDE, multinational enterprises, international technical communication channels, and international commerce), the conditions which help or prevent the structural changes, and the monetary and macroeconomic conditions that encourage and support the invested capitals. Some of the channels to spread knowledge are utilized in our survey. They are the international technical communication channels, and the international commerce, to which the trade fairs, the national market, the formal and informal contacts with other foreign firms are added.
The Social Capabilities are meant as the whole of the social, institutional and economic conditions, which govern the actions, the behaviours and the relationships among the agents, determining an interactive and cumulative process where the economic growth is supported, and, at the same time, it favours the following strengthening.

3.4 The Social Capability Concept in the Industrial District

Considering the central Abramovitz’s contribution to the Social Capabilities theory, at this point it is important to give a definition of Social Capabilities for an industrial district. The aim is, in fact, to use Social Capabilities to explain the formation, the evolution and the performance of industrial district.

In this research, we consider the mentioned Abramovitz’s definition about the Social Capabilities, but, we use it in a slightly different way because it refers to the growth of an industrial district. For this reason it is integrated with some characteristics highlighted by Marshall (1890, 1867), Penrose (1959, 1985), Richardson (1972) and Becattini (1981).

As we have seen in the section 3.2.1, Penrose’s (1959, 1985) contributes are fundamental since as she highlights the role of physical and human resources and collective knowledge, she marks the passage to a new way of conceiving Social Capabilities.

In other words, the role of physical and human resources and of Penrose’s collective knowledge (1959, 1985) is fundamental, not only to provide with a new way of conceiving Social Capabilities, even if she does not use this term expressly, but also for the firm growth.

As we have seen in subsection 3.2.1, Richardson’s (1972) contribution is fundamental because constructing a theory of industrial organization and considering the organization, knowledge, experience and skill or appropriate capabilities; he highlights the importance of the network or of the connections among firms. Consequently the planned coordination is not only of the single firm, but it may be through the cooperation of independent firms. As it is emphasised by Marshall (1890) and as just remembered in subsection 3.2.1, the relationships created among firms must be integrated with the relationships with suppliers, customers, providers of services. In this way the internal capabilities are combined with external ones and this may be in an industry as in an industrial district. The importance of these relationships in a district is one of the reasons why our survey focuses on them as a source of exchange and diffuse knowledge and consequently innovation.

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3.4.1 Industrial District and Social Capabilities in Marshall

If Richardson considers the capabilities in an industry, to identify the Social Capabilities in an industrial district it is necessary to refer to Marshall’s work. As is well known, the concept of industrial district is formulated by Marshall and his wife Mary. He finds that some benefits (externalities) arising from the division of labour, can be achieved not only by big companies but also by many small specialized firms, that are localized and concentrated in a limited geographical area.

It is necessary to remember that when Marshall (1890, 1867) in the Principles of Economics referred to industrial organization he was echoing Darwin’s natural selection. Marshall widened his field of investigation to the biological field and introduced an analogy between the economic science and social science. He stressed that every part of the organism is dependent on the other parts for the achievement of wellbeing, and any dysfunction in any part has consequences for the other parts. Marshall demonstrated the importance of subdivision of functions in firms, as in Smith’s division of labour, and of specialization and the development of capacity, knowledge and machinery. For Marshall the localization of industries has various causes, the first seems to be physical conditions (climate, geographic position, commercial opportunity), economic conditions (existence of natural resources, wealth). Such advantages may have stimulated free industry and enterprise, and the possibility to develop a specialized industry appeals to skilled workers from other areas with fewer opportunities, keeping these opportunities within a geographically limited space. Productivity capacity depends on the accumulation of knowledge and the growth of industries and it is increased by the character of the people and their social and political institutions.

For Marshall both liberty of activity and initiative were important. We can point to the importance that Marshall gave to liberty because here it is possible to identify Marshall’s Social Capabilities definition. For him, Social Capabilities represented the religious, political and economic elements that characterize people’s history. Social forces co-operate with economic forces in an industrial organization: there are often strong friendships between employers and employed.

Marshall also distinguishes between “general ability” and “personal ability”: the first denotes general knowledge and intelligence and it is the ability

“…to bear in mind many things at a time, to have everything ready when wanted, to act promptly and show resource when anything goes wrong, to accommodate oneself quickly to changes in detail
of the work done, to be steady and trustworthy, to have always a reserve of force which will come out in emergency” (Marshall, 1920, book IV, Chap. VI).

These are the qualities that make a great industrial people and for us they depend in part on genes and capacities or capabilities. They need to be supplemented by some knowledge of materials and familiarity. On the other hand, “personal ability” is the special purposes of individual trades. This ability depends largely on the childhood and youth environments.

But, as we have already pointed out in 3.2.2, the modern industrial district is in continuous evolution, the industrial atmosphere of Marshallian memory is absent and in the modern industrial district all the characteristics of the traditional Marshallian industrial district are not present as the analysis of the results of the Italian case studies demonstrates in Chapter 7.

On the other side, the notion of industrial district was formed in Italy, through the work of Becattini as remembered Sforzi in 2008. The modern industrial districts are more hybrids or, better still, using the Markusen classification; they have only some peculiarities of the Marshallian district (see section 4.2).

3.4.2 Industrial District and Social Capabilities in Becattini

For this reason, we must to add other elements that characterize Social Capabilities which were identified in Becattini’s analysis of Marshall’s work. Becattini, in fact, in 1979 defines an industrial district in a neo-Marshallian perspective, as <<…a socio-territorial entity characterized by the active presence of a community of people and a population of firms in a given historical and geographical space>> (trans. Becattini, 2000, p.44). At the same time it is a socio-economic vortex, a small and permanent industrial revolution … a figure that on one side products goods and, on the other side, it reproduces the fundamental social economic relations of the lieu (Becattini, 2000, p.44).

He emphasizes, in this way, the social-cultural relations that characterize a district. Becattini’s industrial district, in fact, comprises three fundamental elements:

- the productive system and its economic-productive relationships;
- the local community and its social and cultural relationships;
- human resources.

The local community can be perceived as a homogeneous system of values within the local environment, the family, the social and political institutions (Becattini, 2000). When we consider
“the population of enterprises”, in other words, a large breaking up of productive process, we visualize a large number of firms specialized in a single phase or in a limited number of phases of a productive process.

The productive process broken up among firms within the same sector or engaged in complementary production influences the formation of a local environment for continuous transactions.

In Becattini’s analysis of Marshall’s work, then, the Social Capabilities are identified in the spatial and moral forces; the environment; the geographic, cultural and social proximity of the firms; the different decentralized phases of processing product.

Issues that need to be considered include:

- the whole of practices, habits, abilities, capacities and aptitudes rooted in the history and in the social atmosphere of the industrial district;
- the social and political institutions that tend to strengthen capacity and scientific ability on one hand, and the best technological practices imposed by the market on the other hand.

In this context, Social Capabilities in industrial district can be defined as the capacities or abilities derived from social and firm networks acquired through years of experience. It depends on the social, economic, political, institutional and innovative evolution of an industrial district and it is associated, as we have seen at the beginning of this chapter, with enlarging the knowledge-learning process and network diffusion and it plays a key role in the transfer and diffusion of tacit knowledge within an industrial district.

Therefore in the Social Capability concept of an industrial district we add all the practices and behaviours often rooted in the history and in the social climate, in the political and social institutions, then, in the temporal evolution of a system which aims at stimulating both the capabilities and the scientific potentialities and the best technological practices imposed by the market.

3.4.3 The Role of Knowledge in Shaping Social Capabilities

In the industrial district literature, human resources are seen as those workers with specific knowledge, skills and capacity. At the same time, firms in districts are characterized by
heterogeneous knowledge bases and by the knowledge which lies on the firm workers’ cognitive skills. Knowledge also lies on the firm organizational memory (Nelson and Winter, 1982). The growth of personal competence, abilities and capabilities and the search for the highest salaries as staff’s frequent changes do not result in loss of competences for a firm. On the contrary, continuous changes help to create and to spread the industrial know-how thus providing the district with advantages. This process is at the base of the collective learning or interactions between agents and firms (Lombardi, 1997, 2003), favoring the diffusion of tacit knowledge.

Moreover in an industrial district, cooperation can reduce competition and networking may enable organizations to access complementary resources. The relationship between firms and the circulation of workers facilitate the exchange of information/knowledge and transform organizational/firm knowledge into inter-organizational or industrial knowledge (see Chapter 2). But in an industrial district knowledge is not only distributed, it is also created as it is demonstrated by the Nonaka and Takeuchi model developed in Chapter 4.

In a district, social networks form more easily, stimulating transfers of information, knowledge and inputs, which generate new knowledge to an extent determined by the social and firm abilities or Social Capabilities.

As we have remembered, in the literature on industrial districts, human resources are seen as workers with specific knowledge, skills and capacity and it is a system which becomes a place where capacities are stimulated, scientific potential is used and technology is developed. More specifically, in any society, we need to consider the steps based on knowledge and on agent relations as they are at the core of any growth process.

In such a concept, therefore, not only what is directly referred to social capital – and then to the relationship among individuals, from which however it is differed – can be included, but also what refers to the characteristics which derive from the relationships among enterprises and from all the relationships which are created between institutions and individuals on one hand and between institutions and enterprises on the other hand.

Box 1: The Difference between Social Capabilities and Social Capital

After evidencing the Social Capability concept and our definition of Social Capabilities in the industrial district, it is important to consider the difference between Social Capabilities and social capital because it is often source of confusion.

We can use the social capital definition as a departure to identify similarities and dissimilarities with Social Capabilities.
The empirical and theoretical literature on social capital is extensive and heterogeneous. The social capital concept was introduced by Bourdieu in 1980 and defined as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition and belonging to a group as a set of agents not only with common properties, but also linked by permanent and useful ties” (Bourdieu, 1980, p. 2). For Coleman (1988) social capital is a “collective good”, partially excludable, and “a variety of different entities with two factors in common: they all consist of some aspects of social structure, and they facilitate certain actions – whether personal or corporate actors – within the structure”. For Putnam (1993), it is a collective resource and it is identified with the characteristics of a society: “Those features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facility coordinated actions”. For Cainelli, Mancinelli and Mazzanti (2007) it is an impure public good and it is identifiable “with the culture of a group of agents, a culture of economic reciprocity and cooperation” and it is interpreted as one component of investment. Metcalfe (2001) provides evidence of the relational nature of social capital that distinguishes them from physical and human capital. For Cooke et al. (2005) social capital concept highlights “relational embedded” and refers to a culture of interaction among people and promotes regional learning for Malecki (2013).

In an industrial district, social proximity favours the formation of relational capital or intangible capital stock defined as a social capital, which is an impure public good. At the same time, industrial districts are characterized by Social Capabilities and tacit knowledge derived from social capacity. Social Capabilities are an intangible flux of knowledge and they augment the process of transfer, diffusion of knowledge that grows as much as the firms and groups’ relations are intensive.

In particular, social capital is involved in social network analysis, Social Capabilities are contemporary involved in social network and firm network analysis. They pend largely on the economic, political, social and institutional evolution of a society and a district.

Moreover it is to be considered that some of these Social Capabilities become repetitive and form a routine for the enterprises (Nelson and Winter, 1982). Others, on the contrary, most of them, keep on developing, even if remaining grounded to the territory.

For this traditional literature and differently from our opinion, it is just the spatial proximity to increase the relationships among the agents, the exchange of opinions, information and ideas. This process favoured in the industrial district, where the spatial concentration of a highest number of small enterprises works in a circumscribed territory, facilities and increases the knowledge spillover. In particular, as Cainelli, Leoncini and Montini (2007) remark, at a local level, in an industrial district, the spillover of the tacit knowledge is easier, while, at a global or international level, it is the codified knowledge to implement the district growth effects. This happens just because at a local level, in an industrial district characterised by many territorially concentrated small enterprises, the direct relationships among the agents are facilitated, sometimes preferred and
even daily. At a global level, the tacit knowledge spillovers are of more difficult realisation and duration, often facilitated by the use of computer technologies, which, however, are classifiable in the codified knowledge.

The tacit knowledge for Cainelli et al (2007) is strictly connected to the learning-by-using and to the learning-by-interaction processes – to which it is necessary to add the learning by doing as we have seen in Chapter 2- and it aims at having an idiosyncratic nature, connected to the specific characteristics of the geographical area where it develops. The tacit knowledge becomes in this way an essential and strategic element in the firms and in the district. If, then, the codified knowledge can be easily transferred inside an enterprise or an industrial district, the tacit knowledge is more complex to transfer (as we have seen in Chapter 2), because it is inside the individual who takes part in the organisation of an enterprise. This happens also because the individual is not always in the conditions to transfer or to acquire this knowledge which depends on the cognitive capabilities and on the personal skills.

At the sometime and on the contrary, as we have seen in Chapter 2, Nonaka’s theory of organizational knowledge creation is based on the idea that organizational knowledge is created through a continuous interaction between tacit and explicit knowledge, on the importance of social interaction and on innovation as the key form of organizational knowledge.

The Social Capabilities, therefore, typical of every industrial district, play a key role in the transfer and diffusion of knowledge and tacit knowledge within an industrial district.

The enterprise, moreover, has an implicit knowledge – which cannot be codified - whose transfer is not immediate, but incorporated, differently from what was asserted by the traditional neo classical approach, where the knowledge was considered as having an explicit nature, easily transferable, as well as any input, and therefore it was reduced to a mere information.

In our opinion, the territorial contiguity, the relationships among the agents, the cognitive capability, the Social Capabilities and the skills can be considered the elements which facilitate the acquisition and the transmission of the tacit knowledge.

Therefore, in this work, we think that the Social Capabilities become some inputs for the birth, the evolution, the performance and the innovation of an industrial district and this is empirically verify in Chapter 8. The relationships among the agents and among the firms, become the foundations for the performance of an industrial district, where the individual experiences are being continuously elaborated. Through the relationships the tacit knowledge is not only exchanged and absorbed, but the new knowledge also is created (see Chapter 4).
With a different perspective, the contextual knowledge as proposed by Belussi and Pilotti (2002), is described as the social output of a historical process of capability accumulation. When the conditions are favourable, a territory becomes an industrial district and the creation and the spillover of knowledge become a consequence of the enterprise developing. Even the contextual knowledge, formed through the dynamics of the local exchanges, is annexed to the territory and it is formed by elements of the codified knowledge, absorbed also from outside and from the tacit knowledge developed with the experience and inside the networks of relationships.

The tacit and contextual knowledge becomes in this way a kind of territorial strategic resources and this capital cognitive form, historically accumulated in the industrial district, can be considered a long-term investment. Only the agents who work in the district can access to it and this process starts a series of original, local skills and of competences. The individuals, however, cannot rely only on their capability, but they must be supported by the institutions, by the enterprises and by the organisations (Lombardi, 2001).

The industrial districts can be therefore considered as a cognitive process, where knowledge and information are processed in a complex way and where social and cultural values are generated (Rullani, 2002) and interpreted as a cognitive system, they become the industrial district, where the knowledge and the community experience are accumulated and concentrated in a single space, through the time. The social networks (the community) and the firm networks (the industrial organisation), the local institutions and the agents create the structure of cooperative and competitive relationships. The existence of these networks facilitates and favours the fluxes of information and knowledge -as we see better in Chapter 4- and where the Social Capabilities, in our opinion, play an important role in the transfer and diffusion of knowledge and tacit knowledge and for the creation of new knowledge and innovation. Spillover and implementation is facilitated by all the relationships, network among agents and firms that can be economic, political, social and institutional. Some of these essential characteristics or determinants which mark the elements of the Social Capabilities in the industrial district must be considered in details.

### 3.5 Social Capabilities and Characteristics in the Literature

At this point it is necessary to identify the characteristics of the Social Capabilities in the literature and referred to an industrial district. This identification is very important because it is the point of

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start to measure the Social Capabilities, although this aspect will be taken up and discussed in Chapter 8.

To identify these characteristics, we must remember that the definition of Social Capabilities adopted in this work is wider than the one used by either Abramovitz (1989) or Ohkawa-Rosovsky (1973), since it is integrated with Marshall (1890), Penrose (1959, 1985) and Becattini’s (1981) notions. It is associated with enlarging the knowledge-learning process and network diffusion and plays a key role in the transfer and diffusion of knowledge and tacit knowledge within an industrial district. Starting from this definition, we should therefore recall that when Abramovitz (1956, 1989) explains economic growth which has occurred over a long period, through the natural resources, such as technological congruence and Social Capabilities, he is identifying the principal components of these latter in terms of the social abilities of the population and institutional characteristics. Using this definition he is following in part the definition of Social Capabilities in Ohkawa and Rosovsky (1973). For these authors, Social Capabilities refer to those factors constituting a country ability to introduce or engage in technological and organizational progress.

We also recall that in 1996 Abramovitz and David included the characteristics and qualities not only of a population, but also of economic, political and social organizations, in their social capability concept. The latter group can be understood as the social, institutional and economic conditions that govern the actions, behaviours and relationships of agents. Social Capabilities are therefore at the base of the interactive and cumulative process that stimulates economic growth and favours its strengthening.

If, however, these elements can explain the growth of a country, that of an industrial district requires the addition of other elements, identified in Marshall, Penrose and Becattini’s works.

In Marshall’s Principles of Economics, elements that distinguish Social Capabilities are identified mainly in the natural endowment of resources and physical conditions (climate, geographical position and access to markets). They are in themselves a comparative advantage in a system, to which the following elements should be added: the richness of the system, the population’s character and ability, the social and political institutions, and overall the “freedom”, that is to say the religious, political and economic elements, the history of a civilization, political events and strong personalities.

Other elements are to be found in the analysis that Becattini carries out on Marshall in 1981. They can be identified as being the strength (moral and not only spatial) that binds the nations together; in
the area, in the proximity (not only physical, but also perceived as the opportunities for the transmission of economic, cultural and social factors) of the enterprises and in the decentralized management of some phases of the production process (an element that is better defined as an economic one).

In particular, as Foss (1996) observes when referring to Penrose (1959, 1985), the social and tacit components of knowledge relating to the workforce are added to the above mentioned human resources or knowledge of the firm. Sets of practices and behaviours, often rooted in history, the knowledge accumulated over time (Nelson and Winter, 1982), the tacit and codified knowledge, the experience, the social climate, the political and social institutions should be added to these features. The industrial district tends to stimulate the capacity, the skills needed to exploit the scientific potential and improve technological knowledge.

Despite the fact that the elements that characterize the Social Capabilities in the industrial district literature are varied, we believe that the rooted causes for an industrial district are to be identified in the historical determinants together with the economic, social and institutional relationships, spatial conditions and innovation.

Taking into account these aspects, the characteristics and the elements of the Social Capabilities in an industrial district (Table 1) include:

- Spatial conditions, where the geographical proximity and/or spatial concentration have to be combined with the dispersion;
- Social conditions, with the tradition, social relationships, skills and ability, knowledge, learning;
- the innovation, human resources, organization, knowledge, markets, firm relationships, internationalization for the Economic conditions;
- the social and political institutions for the Political conditions;
- the technological and organizational progress for the Innovation.

All these characteristics and elements have driven our survey and the identification of indicators and variables to measure the Social Capabilities (Chapter 8)
Table 1 - Characteristics and elements of SC in Industrial District

<table>
<thead>
<tr>
<th>Characteristics of SC in industrial district</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial conditions</td>
<td>geographical proximity – spatial concentration have to be combined with the dispersion</td>
</tr>
<tr>
<td>Social conditions</td>
<td>tradition, social relationships, skills and ability, knowledge, learning</td>
</tr>
<tr>
<td>Economic conditions</td>
<td>innovation, human resources, organization, knowledge, markets, firm relationships, internationalization</td>
</tr>
<tr>
<td>Political conditions</td>
<td>social and political institutions</td>
</tr>
<tr>
<td>Innovation</td>
<td>technological and organizational progress</td>
</tr>
</tbody>
</table>

Measuring SC is therefore very complex since not all the highlighted determinants can be subjected to an empirical verification and considering that they are intangible elements, residual and often incorporated into tacit knowledge.

A literature that can help us in defining and measuring them accurately is not always available for all the indicators. In the literature there is often recourse to the use of proxies like those used for human resources, such as education levels and technological capabilities, incorporated in people and not in machines.

Considering that it is very difficult to measure institutions, researchers often refer to the nature of the government and infrastructure in place.

Among the economic performance indicators of an industrial district, its social absorption capabilities can be used (Hurwicz, 1995; Dahlan and Nelson, 1995), they include education and some related variables such as school enrolments. The indicators relating to R&D, the stock of direct foreign investment, the import of capital goods and the gross domestic product per capita, even if they are not, in our humble opinion, directly included in the Social Capabilities, but rather economic performance indicators are added to the above-mentioned indicators. Through the analysis of these indicators, the literature has pointed out the differences both between national innovation systems, and the absorption of their Social Capabilities. Success can result from high levels of openness to the outside, from trade or from knowing how to trade, from high investment in human and physical capital, the implementation of appropriate policies, by acquiring technology from outside and using it and distributing it efficiently.

Social absorption capabilities, alone, such as high-tech human capital is not, however, sufficient to explain why some economies have higher performances than others. High-tech human capital might be necessary, but is not sufficient for rapid economic growth. It follows, therefore, that the development of human resources and, therefore, the level of education and skills of the workforce.
determine the ability of the country to absorb and make use of external technologies and produce competitive goods and services. The use and creation of technology depend on the existence of indigenous scientists, engineers and managers motivated in the purchase and use of technology.

The other main component, for the absorption of Social Capabilities, is defined by highly specialized human capital that alone is insufficient to explain the different levels of economic performance, as it ought to be analyzed considering other macro parameters such as the inflation rate, investments and the political system.

With reference to some empirical studies conducted at the macro system level (Ho Koo and Perkins, 1995), it was found that there are not always positive relationships between these elements and the economic development of a system. Some analyses have shown that high investments in research and development are often not necessary, while the purchase and actual use of foreign technology are extremely important for the development of the economy. We cannot overlook the importance of orientation and the creation of an innovative system, to which the research and development carried out by public authorities, responding to the needs of the productive sector, is added. Nevertheless the role of government in the administration of law and order, defense, maintaining low inflation rates, stimulating investment and adjusting settings to encourage development and the relationships among firms is important, too. This includes free access to external markets and a competitive market. Internal and external competition, in fact, stimulates firms to employ high levels of technology and maintains new and improved products and processes. The government also has an important role in the supply of different types of infrastructure such as transport and telecommunications, in addition to the local entertainment, education and technology. These, in fact, assume great importance for the absorption of Social Capabilities.

In empirical studies, it is often difficult, if not impossible, to distinguish between the different variables, for which, frequently, the development of a system is studied as a single unit, precisely called its “social absorption capability”. Some of the differences in development and growth can be attributed to the different initial conditions such as the area, access to international routes, access to natural resources, energy resources and industrial materials that are considered variables with a physical dimension (Hurwicz, 1995).

For simplicity, the socio-religious characteristics of the population, their attitude to economic efforts and the value of education are often classified among the variables lying within the human dimension. Among the institutional variables considered are the duration of a political mandate and the prevalence of the rule of law, within which are included the rules surrounding freedom in the drawing up of contracts, the nature and intensity of regular audits together with the types and effectiveness of taxes. The economic variable is measured taking into account the degree of vertical
integration, monopoly, freedom of entry into the market, the prevalence of the government, exports and imports.

Not all variables identified in the literature, however, in my opinion, seem to explain the Social Capabilities at least with reference to the industrial district and do not seem to be entirely consistent with the definition of Social Capabilities given in this work. For this reason, with the help of our original questionnaire we implement the Social Capabilities notion and we adopt the “scoreboard” approach using a set of indicators to capture different characteristics of Social Capabilities (Chapter 8)

3.6 The Role of Social Capabilities in Innovation

At this point, because the Social Capabilities play a key role in the transfer and diffusion of knowledge and tacit knowledge within an industrial district and with this latter is also diffused the innovation it is essential to consider the role of Social Capabilities in innovation.

As we have seen in section 2.6, the relationship between knowledge and innovation is fundamental inasmuch as the former feeds the latter and is then fed in its turn. It represents a decisive factor in the survival of businesses in a global market for the creation of continuous competitive advantage, and provides a basis for their performance. Consequently, a higher level of knowledge and of Social Capabilities corresponds to a higher degree of innovation as we verify in the empirical part of this work.

Generally, the economics works reflect on the introduction of new products, new process and new organization, instead in this work we analyse other different types of innovation because we consider the small and medium-sized businesses.

The relationship between knowledge, Social Capabilities and innovation does not, in fact, only involve large enterprises but small and medium-sized businesses as well. In these latter innovation is to be understood not only as an investment in research and development and in the adoption of new technologies. It also consists in a gradual change of types of product, adapting to constant changes in consumer tastes, implementing new organizational methods, both internally and in their relationship with other companies, customers and suppliers (Cappellin 2010) as well as creating new types of contract, means of distribution, marketing slogans and new individual ways of working (Tether et al. 2005), marketing and design innovation.
As we know (see Chapter 2), the firm represents the organization where technological knowledge is produced through a process of the integration of learning and formal research and for this reason it is a centre of specific competences and capacities. Thus, we can say that a firm’s capacity for accumulation of knowledge produces innovation that is tightly connected to the acquired competences and, above all, to those acquired through research.

Within districts, innovation, technical progress and capital accumulation determine the increase in productivity and development, while technical progress can also be derived from common management of the processes of production. The combination of codified and tacit knowledge leads to localized knowledge (Antonelli 1996, 2008b; Metcalfe 1999; Ibrahim et al., 2009; Casanueva et al., 2013), which is not easily imitable and is characteristic of industrial districts. Over time, firms that operate in industrial districts accumulate experience of production techniques, learn from their own and others’ mistakes, interact with suppliers and customers and share the information collected, all of which enables them to increase yields using known techniques.

In the neoclassical model, exogenous changes in production and utility functions cause changes in the behaviour of the operator, but not in the structure of their preferences. When the preferences and technologies are endogenous, the social interactions simultaneously modify and complete those of the market (Hanush and Pyka, 2007). In other words, each firm and each consumer changes its behaviour because of their interactions with one another. This makes access to external knowledge easier, which generates new technological knowledge and, from this, innovation. In fact, if we consider knowledge as simultaneously being both an input and an output, the crucial role of the external in generating technological knowledge cannot be ignored.

3.7 Conclusion

In this chapter we have seen that if in the traditional industrial district, the literature tended to emphasize the role of social and cultural proximity between agents for knowledge sharing, it is ignored the role of the Social Capabilities and the firms’ interaction for knowledge creation and diffusion.

It is true that local and agent relations are an important source for the exchange knowledge and the human resources are seen as workers with specific knowledge, skills and capacity. But the role of the firm is fundamental too not only because the firm can be considered the centre that governs the knowledge needed to produce and spread technology as we have seen in Chapter 2, but to this must be added the relationships that firms within a district can create for themselves with the outside
world. These are a very important source of new knowledge for innovation and are a source of creation of internal knowledge for firms in the district.

In a district, social and firm networks form more easily, stimulating transfers of information, knowledge and inputs, which generate new knowledge and innovation, as we will better see in Chapter 4, where we use the Nonaka and Takeuchi model in the industrial district, to an extent determined by the social and firm’s abilities or Social Capabilities.

For this reason we have pointed out our attention in this chapter on the Social Capabilities, departing to the capabilities and dynamic capabilities concept. We have put in evidence that if Penrose and Richardson introduced the capabilities concept, Abramovitz is the father of the Social Capabilities. We have started to the Abramovitz Social Capabilities definition and characteristics, considered at the sometime the definition of Ohkava and Rosovsky (1973) and Abramovitz and David in 1996, for arriving to the Social Capabilities definition and characteristic for explaining the formation and the performance of industrial district. We have also remarked how our Social Capabilities definition and characteristics differ because we refer it to the industrial district.

Any industrial district, in fact, is characterized by specific Social Capabilities observed in our empirical analysis (Chapter 7), because as it is showed in the literature on industrial districts, human resources are seen as workers with specific knowledge, skills and capacity and it is a system which becomes a place where capacities are stimulated, scientific potential is used and technology is developed. More specifically, in any society, we need to consider the steps based on knowledge and on agent relations as they are at the core of any growth process. At the same time, firms in districts are characterized by heterogeneous knowledge bases and the knowledge that resides in the firms’ skilled knowledge workers. The aggregation of a business’s workers’ various competences and abilities constitute its capabilities, or the Social Capabilities of the industrial district.

Consequently, the key determinants of the birth and performance of an industrial district can be found in the historical and cognitive reasons explained by the economic, social, cultural and institutional relations that characterize a population in a specific territorial context. But, geographical proximity alone is not sufficient to generate learning and knowledge; the role of social, economic, cultural and institutional relational proximity is also very important (Maskell and Malberg, 1999; Amin and Cohendet, 2004). At the same time the firm competitiveness depends on external sources of knowledge and all firms benefit from knowledge externalities.

Taking into account these aspects and despite the fact that the elements that characterize the Social Capabilities in the literature are varied, the characteristics and the elements of the Social Capabilities in an industrial district include the geographical proximity/dispersion for the Spatial
conditions; the tradition, social relationships, skills and ability, knowledge, learning for the Social conditions; the innovation, human resources, organization, knowledge, markets, firm relationships, internationalization for the Economic conditions; the social and political institutions for the Political conditions and the technological and organizational progress for the Innovation.

Measuring Social Capabilities is therefore very complex since not all the highlighted determinants can be subject to empirical verification and given that they are intangible elements, residual and often incorporated into tacit knowledge and a literature that can help us in defining and measuring them accurately is not always available for all the indicators. Not all variables identified in the literature, in fact, seem to explain the Social Capabilities at least with reference to the industrial district and do not seem to be entirely consistent with the definition of Social Capabilities given in this work. Based on this consideration, in the empirical part of this work, we implement the Social Capabilities definition through the questionnaire use and with the help of each question we measure Social Capabilities and to obtain information that permit to have the development of qualitative and quantitative variables (Chapter 8). We show how the innovation, generated by knowledge and Social Capabilities, induces changes in the competitive dynamics of the garment sector and how knowledge, Social Capabilities and innovation are the key variables in understanding the recent structural changes in technical and organizational terms, observed in an industrial district. Knowledge and, in particular, tacit knowledge and Social Capabilities, in fact, represent the decisive factors in the creation of competitive advantage, in the survival of firms in a global market and provide a basis for continuous innovation.
CHAPTER 4

CONCEPTUAL APPROACH:
NONAKA AND TAKEUCHI’S MODEL IN THE INDUSTRIAL DISTRICT

4.1 Introduction

As we have already pointed out in Chapter 3, the modern industrial district is in continuous evolution. The industrial atmosphere of Marshallian memory is absent and the concepts of the traditional Marshallian industrial district do not always apply in modern contexts. In particular, the description of knowledge creation and diffusion within industrial districts does not explain how knowledge and particularly tacit knowledge gets transferred or exchanged over time inside these districts. Nor does the traditional theory explain how innovation happens. Our contribution is to overcome this gap through the application of Nonaka and Takeuchi’s model (NTM) to the knowledge creation and transfer in modern industrial districts.

In this chapter, in fact, we start with the industrial district literature and with the description of the Marshallian industrial districts given by Markusen in 1996 where she compares the traditional Marshallian industrial district to other district typologies (4.2). We describe how knowledge and consequently innovation are created and diffused in a traditional industrial district and in a modern industrial district (4.3). But in reality it does not exist a strong theory about it and the gap in their explanation particularly about the innovation is strong. This gap is filled by Nonaka and Takeuchi’s model described in section 4.4. In this context the NTM is used not only to underpin the knowledge creation and diffusion in an industrial district, but also to explain how innovation happens in a firm and in an industrial district, even if the NTM has various shortcomings when it is used in this way. We consider, in fact, the critics to Nonaka and Takeuchi’s model presented in sub-section 4.4.1.

The conclusion is in section 4.5

4.2 The Modern Industrial District

The problem of industrial district is that it does not explain how knowledge transfer happens or changes over time in industrial districts and the theory does not explain how innovation happens too. We propose to overcome this gap through the application of the NTM to the concept of industrial district.
In fact, as we have already pointed out in Chapter 3, after the traditional literature about the industrial district by Becattini (1979, 1989, 2000) and Brusco (1989, 1991), based on the canonical form of the Marshallian industrial district, a great number of works (see for example Lorenzoni, 1990; Markusen, 1996; Rullani, 2002; Guerrieri and Pietrobelli, 2004; Cainelli and Zoboli, 2004; Ferrucci, 1999) have analysed the evolution of the industrial district. A part of the literature has attempted to explain the evolution of the district by focusing on the concept of leader and on constellations (Lorenzoni, 1990) or has identified other forms of industrial organization (Markusen, 1996) and geographical agglomeration (Guerrieri and Pietrobelli, 2002). Other economists (Cainelli, 2003; Cainelli and De Liso, 2004; Leoncini and Montresor, 2008) have analysed the Italian industrial evolution focusing on the impact of the innovative activity and its connected agglomerative effects and highlighting how small- and medium-sized Italian enterprises change their size and reach different conclusions with respect to the supporters of the non-evolution of the district. In the district literature, on the other hand, as already said, there are not precise, rigorous references on how knowledge transfer happens or changes over time in industrial districts and the theory does not explain how innovation is created.

In this section in fact, we start with the description of the Marshallian industrial districts and with the description given by Markusen in 1996, and we present other industrial district typologies identified by Markusen based on firm-size, inter-firms relations and internal orientation versus external orientation. This international comparison is important because the modern industrial districts are more hybrids, or better, using the Markusen classification again, they have only some peculiarities of the traditional Marshallian district33. Markusen, in fact, has a more dynamic vision of the industrial district. In the empirical part of this work, in fact when we analyse the results of the case studies (Chapter 7), we highlight the characteristics of the districts and compare them to the Marshallian industrial district.

As it is well known and just said in Chapter 3, the concept of industrial district is based on the Marshallian economic and social idea and on the importance of economies which are external to the enterprise, but internal to the district. Marshall (1890) finds that some benefits (externalities) arising from the division of Smith’s labour, can be achieved not only by big companies but also by many small specialized firms, that are localized and concentrated in a limited geographical area. The Italian industrial district is considered a specific form of industrial organization, where the long

33 For Markusen and Park (1994) the industrial district definition is different from the definition proposed by the traditional Italian school. The industrial district, in fact, is considered <<... a sizeable and spatially delimited area of trade-oriented economic activity which is characterized by an economic specialization, being it resource-related, manufacturing, or services.>> (Markusen and Park, 1994, p.85). As a consequence, the ‘Italian’ version of industrial district is the only one possible form of inter-firm organization, very close to the original Marshallian idea.
Period informal bonds among businesses tend to generate economies of agglomeration and Marshallian externalities. These externalities are able to replace the economies of scale typical of the sole big company with the agglomeration economies linked to the increased intensity of knowledge spillovers, to the easier workers’ mobility within the district and to the presence of intangible, non-measurable factors, such as the mutual trust, a sense of belonging, the sharing of social and political values (Cainelli, 2003). These economies have in their canonical form the characteristics to be external to the firms, but internal to the district and the local community; they are widespread because no actor can appropriate them at the individual level; they are localized because they belong to the firms located in the district; they are manufactured as they are originated by reports of such a nature; they are conditioned by technological, socio-institutional and market determinants; and they are generated unconsciously by local productive actors (Ferrucci, 1999).

External economies are then of crucial importance for the district competitiveness as they allow the local actors who operate in a competitive environment, but, at the same time, mitigated by the presence of a shared and rooted subculture, to achieve competitive advantages that, otherwise, individually, would not be able to reach. The spatial concentration of specialised firms gives rise to a strengthening of their relations, generating, and self-feeding external economies. All this, however, presupposes that the specialised firms are spatially concentrated and that the relations of exchange occur within the same district. As a consequence a face-to-face interaction follows together with the adoption of common languages, the reduction of transaction costs, an easiness and informality of relations of exchange, connected to the physical and cultural proximity among the different district firms. This facilitates information exchanges of a technical and technological nature.

Analysing the “Marshallian” district or the traditional Italian industrial district (Fig.1), Markusen proposes a conceptualization based on the following essential characteristics: firm-size, inter firm relations and internal orientations versus external orientations. She evidences that the traditional industrial district is characterized by small firms concentrated in a local area, buying and selling from one to another and exporting or selling outside the district. It has low level scale economies and key investment decisions are made locally. In this district, Markusen believes that the economies of scale are low and not sufficient to prevent the emergence of large companies. Within the industrial district the substantial trade is transacted between buyers and suppliers, while there are few links with firms which are external to the district. The traditional industrial district is characterized by strong ties (family ties and friendship ties), the firms have the same culture and cooperation between the local community and the firms of the district exists. It develops the tacit
knowledge and, as it was pointed out in Chapters 2 and 3, within the industrial districts, knowledge, and particularly the tacit knowledge, spreads more easily through the following channels: the observation for imitation; the different networks or relationships that are formed inside the district; the workers’ mobility. On this latter aspect we discuss in details in the next section.

**Figure 1 - Marshallian industrial district**

![Diagram of Marshallian industrial district](source: Markusen, 1996)

The raw materials, originated from outside, are exploited inside the district and the final product is sold outside.

The traditional Marshallian industrial district is special in terms of nature, quality and flexibility of the local job market. Workers move among firms within the district and are more strongly tied to the district than to the particular firm for which they work. The Marshallian district is considered as a relatively stable entity with a single cultural identity and productive specialization, technical experts, includes local financial institutions. All of these features constitute according to Markusen the phenomenon of the agglomeration that refers not to the localization of the enterprises and workers, but to external economies that are created between firms and suppliers. This existing cooperation can be unknown in the Marshallian districts.

Unlike this typical Marshallian district, an empirical analysis of Markusen shows that Italian districts experience frequent exchanges of workers between suppliers and customers and the cooperation among competing enterprises divides the risks, stabilizes the market and promotes innovation.

In this case all firms and individuals are involved in relationships, and they can communicate and exchange information with their neighbours.

Markusen, then, describing the main features of the Marshallian industrial district, criticizes its paradigm, wondering why some places are more productive than others, despite the high mobility of
workers. She identifies "the new industrial districts" which derive from the existence of a variety of places where, in spite of the high mobility of workers, the productivity is different and, consequently, the degree of development is different. Through an inductive analysis, based on the study of the case and of the US metropolitan regions, she shows how the power of multinational corporations or of the State can encourage the formation of industrial districts, accomplishing what instead is made difficult for small businesses. The case studies concerning the movie industry in Los Angeles, the Orange Country, the Silicon Valley, have allowed to observe how secular changes in technology and markets promote the formation of external economies and new forms of regional industrial organization. Markusen thus shows that the new industrial specialized districts constitute a new paradigm and allow to prove that other districts are both theoretically plausible, and empirically emergent. For each type of located district, the role of institutions at national, regional and local level is examined together with the market, the consumers, the goods and service producers, the innovation promoters and the relative implications for the distribution and the workers’ recruitment. The role of large enterprises, especially those with inside and outside market power, and of industrial agglomeration is added to these and finally the incorporation of firms, both in the districts and in the networks, is examined. She also studies each region long-term potential dynamics, including the future competitiveness, the ability to create human and physical resources linked to specialised sectors and, finally, she analyses the political diversity and the presence of a commercial union. Markusen then carries out a careful analysis to identify all the elements that can characterize these industrial districts which are defined a rather large and spatially delimited area of trade-oriented economic activities, characterized by an economic specialization of resources, articles and services (Markusen, 1996, p.296).

After the presentation of the “Marshallian” or Italian industrial district, Markusen describes other typologies: a “hub and spoke” district, where the district firms are linked around one or more stars; a “satellite platform” district, which is a whole of unconnected branch plants embedded in external organization links; and a “state-anchored” district, based on one or more public-sector institution (Markusen, 1996, p. 296).

The “Hub and Spoke” (Fig.2) districts are characterized by a single big star: the Toyota City and Boeing organization are examples. Toyota City buys from local and external suppliers and sells mainly to external buyers, which might be large customers such as airports, or, as in the case of Boeing, the military or defence sector.
Figure 2 - Hub-and-Spoke District

Hub-and-Spoke districts are formed by one or more stars vertically integrated and surrounded by suppliers. In this type of district small firms have relationships each other, and new firms might have connections with other enterprises that profit from the agglomeration. Scale economies and levels of cooperation are high.

Hub-and-Spoke district forms can differ: for example, they can be linked, so in this case small firms are entirely dependent on the big firms or institutions for buyer and seller relationships, or they may be nuclear, so in this case small firms profit from the agglomeration externalities of the big organizations without necessarily entering a buyer or seller relationship.

Usually the decision to invest capital is taken locally but the consequences of such a decision will be global. The internal labour market of the district is less flexible than in the Italian model. In the long term this type of district depends on the big firms or stars.

The Satellite Platform consists of a branch office from moderate to high scale economies and the externalities are based on multiplant firms. Multiplant firms are established, at a certain distance from major urban agglomerations, by national or provincial governments to enhance regional development in remote areas. One example is the Research Triangle Park, an agglomeration of the research centres of major multinational corporations; another is Sophia Antipolis, a system directed from the outside.

In this type of district the big firms remain outside the district but they make the key investment decisions. Scale economies are from moderate to high level and turnover is from a low to a moderate one. A trade inside the district between customers and buyers is minimal and relationships among local suppliers are non-existent. In the Satellite Platform District heterogeneous enterprises do not enter cooperative ventures or they engage in innovative partnerships.
The Satellite Platform District (Fig.3) is characterized not by networks within the region, but by networks with the various corporations. Mobility of workers inside and outside the district at managerial, professional and technical level is high.

Figure 3– Satellite Platform District

In this district typology high skilled workers have links with the firm rather than the district. In this type of district there is a little evolution of a unique local cultural identity, but the growth in depressed areas is encouraged.

In the State district (Fig.4) the public entity might be a military base, a defence plant, a university, a concentration of government offices (Markusen, 1966, p.306). In this case the local structure is dominated by one or more big firms and economic networks are determined neither by political institution nor by private firms. Some examples of these districts are the military bases of Santa Fe, San Diego and Colorado Springs.

Here the scale economies are relatively high and the sector growth depends on the level of public expenditure. If decisions are made external to the district, they may take less account of the impact on regional development. The labour market tends to be reflected by local or regional cycles between customers and suppliers. The workers are of the big institutions first, then of the district, then of small firms. These play a marginal role in this type of district. Normally these local firms do not cooperate one with another. They may participate in intra district trade with dominant institutions and suppliers.
There are other districts within metropolitan areas that have elements of all the above-mentioned types. However, district evolution is continuous; district can be transformed.

According to Markusen the investments, which come from large and small firms, or the State, the geographical agglomerations and the mobility of workers are the fundamental elements of district constitution. Cultural identity seems to play a very small role; small and medium sized firms respond to variations in demand and entrepreneurialism. Cultural identity is generated by districts and is formed *ex post* and not *ex ante*.

As we have seen the district typologies are different and every district has its own peculiarities, its own cultural and social background and network system. The typologies outlined above are only examples in order to better understand the district evolution particularly in a global competition.

The evolution of the Italian industrial district leads to a new competitiveness connected to the globalization of the market and the technological changes (Guerrieri and Pietrobelli, 2004). In such a context, the contiguity between enterprises and the spatial concentration seems to be a fundamental precondition for the establishment of a district, but only in the initial phase, which Guerrieri and Pietrobelli define as “Marshallian condition”. As a result, instead, with the development of technological knowledge which is added to the local ones, a new typology of district develops. They define it "post-Marshallian condition" and it gives rise to a geographical dispersion (Guerrieri and Pietrobelli, 2004, p 912). In this vision a single district form is no longer favored or a better organizational model does not exist, as everything depends on the place and the sector in which one operates.

Ferrucci (1999) has a different opinion. He believes that, if on the one hand, the technology, the market and the socio-institutional actors, who are locals integrated into system, constitute the platform of the district from which external economies start and feed themselves – economies which produce their positive effects on the local productive system-, on the other hand, the Marshallian firm district, in its canonical form, finds difficult to evolve as its work is stable and it is
historically anchored to the local system. The Marshall’s district is, in its functional logics, ordered and regular, and in its evolution, it does not admit jumps or radical discontinuity.

<<In questo senso, il distretto industriale esprime sostanzialmente una limitata varietà strategica delle imprese, connotate da una forte contextualizzazione, da modelli organizzativi, interorganizzativi e istituzionali simili, da strategie simili; c’è una sorta di monomorfismo d’impresa, tale da condizionarne negativamente gli eventuali profili evolutivi del sistema che dipendono dalla varietà strategica delle imprese (In this sense, the industrial district expresses substantially a limited strategic variety of enterprises, which are featured by a strong contextualization, by organizational models, by similar inter-organizational and institutional models, by similar strategies; there is a sort of enterprise monomorphism, able to negatively influence their possible evolution profiles of the system that depend on the strategic variety of enterprises)>> (Ferrucci, 1999, p 9).

The traditional district presents its vulnerability at the moment in which the technological, institutional and market conditions, at the base of the competitiveness of the system, change radically. This can occur because of the use of Information and Communication Technology (ICT), of internationalisation or of new marketing policies to adopt and not belonging to the district tradition, for the emergence of new international competitors, for the appearance of a new international demand for consumer goods, for the emergence of new technology. The rules are lost when the foundations of knowledge and skills present in the district are no longer working despite they are historically consolidated and require new knowledge management to enable competitive advantages of innovative type. In other words, changing the competitive advantage that requires the acquisition of new skills from outside or new organizational models, you can engender destabilization of the district can be originated. The same could become particularly vulnerable, with consequent negative effects on increasing incomes induced by Marshallian external economies (Ferrucci, 1999, p13).

In a modern industrial district open to internationalization, to the new dynamics of the market, the external economies, as well as already Marshall noted\(^{34}\), do not depend only on agglomeration and production, on one side, society and economy, on the other side, such as inseparable characteristics, but also on the processes of technological innovation and product, which, as already pointed out, can call into question the traditional district model.

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\(^{34}\)As Ferrucci says, Marshall himself was aware of the variety of the external economies and he knew he could not trace them back only to the agglomeration ones. Other sources of external economies are induced by the progress of science and technology and of the industry in general.
In the modern district in fact the gradual internalization of the externalization is important. This is possible also thanks to the emergence of leading firms, which often become a strategic necessity to promote the change and to reduce the district inertia.

As we have seen in Chapters 2 and 3 the Italian industrial district is in continuous evolution and some fundamental characteristics as geographical, economic, social and technological dimensions are changed during the time. The geographical agglomeration is changed versus dispersion as we have underlined in Chapters 2 and 3. The social dimension changes for the increase of education that it is in contrast with the relations between master and apprentice or teacher and learner that Polanyi called “indefinable knowledge” or tradition (see Chapter 2). The economic dimension changes for the market globalization. The internationalization involves the satisfaction not only of a local demand but of the international demand too. In other words the demand tends to assume mass dimensions and consequently the firm networks change. The technological dimension involves an acceleration of the incremental innovation and reduces the life cycle of the product. A consequence is the rapid obsolescent of the products, knowledge and innovation, but at the same time the continuous technological changes promote the knowledge growth. Firms think it is necessary to create knowledge through bonds not only local, but also with far firms, for which the organizations and the international knowledge are increasingly important for the growth and evolution of industrial globalized districts. In this perspective, one could believe that Marshall’s industrial district could not be the most adequate to explore new technological opportunities: the economic activity organization is, as a matter of fact, less locally limited and less vertically disintegrated, therefore researchers think of a post-Marshallian structure. In this structure, more are the Social Capabilities, the higher is the transfer and the diffusion of knowledge and tacit knowledge in the industrial district and the higher is the creation and diffusion of new knowledge and innovation. In the next section we study in depth how and by which means the transfer and diffusion of knowledge, tacit knowledge and innovation can occur in the traditional industrial district and in the modern industrial district.

4.3 Modern Industrial District, Knowledge and Innovation

In this section we explain how knowledge and consequently innovation are created and diffused in a traditional industrial district and in a modern industrial district.

As we have highlighted in the previous section, the Marshallian industrial district is conceived as a close network of economic and social relations among small enterprises through which forms of social capital (technical and organizational knowledge, behavioural rules, trust in relations) are
originated, through which external economies evolve (Balloni, 2001). It has been noted that fundamental elements for the creation of a district are the territory, the labor market, the economies of agglomeration and the technology.

The recent knowledge-based literature (Camuffo and Grandinetti, 2006; Maskell, 2001; Grandinetti and Tabacco, 2003; Rullani, 2003) considers the importance of knowledge spillover and explains the knowledge creation and its spillover not only inside the firm, but also in the neighbourhood, because of the geographical proximity among the firms themselves. The district model changes in the international context which requires the addition of other channels of knowledge spillover and creation. However, the industrial economists, defining the knowledge spillovers as a "flow of externalities among productive factors and/or users of innovations "adjacent" among them">, consider the space, i.e. the geographical proximity among businesses and, therefore, the territory, as a pure physical element, even if it is essential to the diffusion of positive spillovers. The territory, on the contrary, as the economists$^{35}$remark, can no longer be considered as a pure physical space of the learning process, but it also plays an active role in the knowledge creation and spillover, therefore the channels through which the knowledge spillovers also spread outside the firm, i.e. in the local system (Capello and Faggian, 2002) and outside the same district boundaries (Camuffo and Grandinetti, 2006). The industrial districts, in fact, in the knowledge-based prospective can be considered as a cognitive process, where knowledge is processed in a complex way and where social and cultural values are generated inside the district, where the knowledge and the community experience are accumulated and concentrated in a single space, through the time. The social networks (the community), the firm networks (the industrial organisation), and the local institutions create the conscious or unconscious structure of cooperative and competitive relationships.

The fluxes of knowledge can be shared in an industrial district through three channels: the observation for the imitation; the social and firm networks, the human resource and workers’ mobility.

With the observation for imitation, an innovative product is an artefact that embeds in itself tacit and codified knowledge as well as the behaviour of an innovative enterprise that introduces the new innovative product utilizing a particular marketing activity. Also in this case the final and innovative good observation and the marketing activity observation incorporate the necessary knowledge to develop the final good and the marketing. The observation for imitation depends on the individual absorptive capacity (Witt and al., 2007), on the organization absorptive capacity.

$^{35}$According to the regional economists, the channel through which the knowledge is spread across the territory consists of the collective learning. They consider the territory as the place where the relationships among local actors are established and apply the concept of relational space intended in the theory of the milieu, as the set of relations of market, power and cooperation that arise among economic and culturally close actors.
(Cohen and Levinthal, 1989) and on the Social Capabilities to absorb the largest number of knowledge enclosed in the artefact or in the marketing activity.

In the industrial district the existence of firm networks facilitates and favours the knowledge diffusion through vertical and horizontal integration. It is also possible that two firms do not have a direct relationship, but indirect relationship. In other words, they have in common a third agent, a supplier, for example, through which knowledge is transmitted to both of them.

For the knowledge diffusion, the social networks are very important. In fact as we have seen in the previous section, the industrial district is characterized by high work mobility among firms within the district and by high relations among works of different firms. In this way, as the artefact, people can be knowledge carrier (Camuffo and Grandinetti, 2006, p.37) and the diffused knowledge can be tacit and/or codified.

Another delicate problem, as already remarked in Chapters 2 and 3, is the knowledge absorption and particularly the individual absorption capacity, the organization absorptive capacity, the knowledge intentional transmission and the Social Capabilities that can make difficult the imitation, transfer and diffusion of knowledge.

In the presence of cognitive proximity and cognitive interaction as in an industrial district, the knowledge transfers are more frequent. The cognitive proximity implies that the observers must have basic knowledge and skills similar, not equal to those of the subject who produced the innovation. The cognitive interaction implies the individual capabilities to communicate (Figure 5).

If innovation is incremental it can circulate easily and be absorbed by local actors, if, on the other hand, it is radical the result is ambiguous, because it depends on the business district that has generated it and on the knowledge present in the district. In this case, the knowledge creation and the district evolution come from the presence of the pioneer firms. These are characterized by a specific innovation capability.

Another source of knowledge is the presence of a large number of small and medium firms characterized by the division of labour and by presence of productive specialization. It is then necessary to add the informality of interpersonal relationships that characterize the industrial districts. The firm dimension and the social networks favour not only the knowledge creation but also the internal knowledge diffusion.

The knowledge creation feeds the channels of knowledge transfer examined before. In turn the channels of knowledge transfer create new knowledge and they became determinant factors of innovation (Landry et al., 2002; Barrutia and Echebarria, 2010).
Particularly, the imitation involves the new knowledge creation and the possibility to introduce incremental innovations, to improve the efficiency of the production process and to improve the marketing. In other words, the imitator firm combines the precedent knowledge that resides inside the artefact and inside the strategic choice of the imitated firm with its own knowledge. New knowledge and innovation can originate from the human resource mobility or worker’s mobility in the district and from the cooperative relationship in the firm and among firms.

Another element that characterizes the industrial district is the exchange of knowledge with suppliers of technology and/or expert subcontractors. When the relations are cooperative, it is a source of knowledge transfer and combination. These relations produce innovation in the district firm.

Figure 5 summarizes knowledge diffusion and creation in the industrial district described in this section, also highlighting the importance of the absorptive capacity, Social Capabilities, cognitive proximity and the cognitive interaction. The interactions not only facilitate the transfer of knowledge, but they also support the production of new knowledge. The knowledge transfer and the knowledge combination tend to merge in a lot of situations to develop innovation.

We must remember that a firm, in terms of its internal structure and its organization, can be considered as a social system or knowledge system (Tsoukas, 1996) where local relations are an important source for exchange knowledge and for knowledge creation. The local relations transform organizational or firm knowledge into inter-organizational or industrial knowledge as we have stressed in Chapter 2.

As regards the globalization process we must also consider the resources of knowledge external to the district that contributes to the knowledge creation, transfer and combination (Figure 5). In other words it is necessary to consider the knowledge and innovation processes of externalization-internalization. The channels through which the external knowledge and innovation are transferred in the district are: the work of human resources outside the district, the relations with suppliers and customers outside the district, the imitation of artefacts product by external and rival firms, external experiences, new firms composed of external and internal human resources, external investment that have created new firms or bought existing firms. The external holding is attracted by district assets and district spillover. The new firm created or bought tries to integrate with the district. The new firm is a new mechanism of knowledge transfer from outside to inside the district and it increases the knowledge combination.
In all the examined cases an important role between internal and external environment is played by local institutions, centre of research, university, associations because they can enhance and perform policies oriented to support the district enterprise innovation and internationalization. At the same time they can strengthen and create the relationships among the local actors.

With the modern industrial district the relations and activities are integrated with the delocalization of some phases of the production process, with licensing and subcontracting agreements, with external buyers, with external suppliers, with external customers as the case study demonstrates, particularly as regards the baby clothing. The modern firm of the district absorbs and transfers international knowledge to the other firms of the industrial district and in this way the industrial district becomes global.

In a global context, the innovations are more complex than in traditional ones (product and process innovations) because it completely modifies the firm organization and the relations. The just in time production is introduced, the ICT is used, a specific strategy is adopted. Consequently the absorption of codified knowledge is more difficult. This must be re-codified to be adapted to the specific firm characteristics. The last process implies the combination of external codified knowledge with internal tacit knowledge for the district firm. The diffusion of the complex innovation in the industrial district becomes more difficult through the mechanisms of knowledge transfer and this more complex transfer requires higher investment in human capital. At the same
time the firm must maintain the competitive advantage through the continuous internal creation of tacit knowledge.

If there are few dynamic firms, it is possible a strengthening of the larger companies and a weakening of the industrial district.

As we have underlined, one problem with the concept of industrial district and with the description of knowledge creation and diffusion now described is that the theory does not explain with rigour how knowledge and particularly tacit knowledge is transferred or exchange over time in industrial districts. Particularly, the theory does not explain how innovation happens too.

We propose to overcome this gap through the application of the NTM to the industrial district. In fact, as we have written in Chapter 2, the Nonaka’s theory of organizational knowledge creation is based on the idea that organizational knowledge is created through a continuous interaction between tacit and explicit knowledge in a firm. He points out the importance of social interaction referring to Polanyi’s tacit dimension and considers the innovation the key form of organizational knowledge. It is possible to apply Nonaka and Takeuchi’s model to the modern industrial district because in an industrial district, as we have analysed in this section, knowledge and consequently innovation is created and diffused through the observation for the imitation, the social and firm networks, the human resource mobility, the external – internal relations. It is also important to take into consideration that the NTM is referred only to a firm, what happens in a single firm is described, on the contrary, the industrial district is formed by many small specialized firms. But it is possible to solve this problem because, as Brusco (1991) said, the district can be meant as a big enterprise. We consider in our analysis the industrial district such as a unique and big firm where the organizational knowledge is created through continuous interactions between tacit and explicit knowledge among agents (that in the districts are people and firms). At the same time, in the district it triggers a self-generating process also caused by a single firm that starts this process. The Social Capabilities in this context assume a key role in the transfer and diffusion of tacit knowledge and for the creation of new knowledge and innovation as we have seen in Chapter 3. We verify this relation between Social Capabilities and innovation in the empirical part of this work as well as the knowledge creation and diffusion (Chapters 7 and 8).
4.4 Nonaka and Takeuchi’s Model

The aim of this section is to explain how a firm creates new knowledge and innovation thus improving organization performance through Nonaka and Takeuchi’s model, in which the organizational knowledge creation is considered (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka, 2007). The organizational knowledge, in fact, is created through a continuous interaction between tacit and explicit knowledge.

We have chosen this model because it became a paradigm for organizational knowledge dynamics. It is the best developed in the literature because it is focused on knowledge creation and diffusion in an economic organization. It can be used in a modern industrial district to explain how the new knowledge that is originated outside is shared within the organization, stored in the company knowledge base and utilized inside to develop new knowledge, technologies and products and then shared outside again. This model also explains how individual knowledge can be transformed into organizational knowledge and it used to explain the process of innovation through the process of organizational creation. In an economic organization such as an industrial district, knowledge is created with a complex interacting process among external and internal workers, suppliers and buyers. In this way, this model can be used to explain the relations among firms too.

In order to explain the NTM, we must remember, as we have seen in Chapter 2, that Nonaka in 1994 and Nonaka and Takeuchi in 1995 consider knowledge as “...a dynamic human process of justifying personal belief towards the “truth”. >> (p.58) and that the mobilization and conversion of tacit knowledge is the key for the knowledge creation. Based on the Polanyi’s work (1966), for Nonaka and Takeuchi (1995), tacit knowledge is considered personal, context-specific and hard to formalize and communicate. Tacit knowledge includes cognitive elements in which human beings create world models or mental model as paradigms, perspective, belief and viewpoint. It is in our mind and body but we do not know how to explain it. Another element of the tacit knowledge is the technical element that includes know-how, skills and the abilities.

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36 Actually, Nonaka in 1994 just defines knowledge as being “justified true belief”, and considers knowledge as “a dynamic human process of justifying personal beliefs as part of an aspiration for the truth” (Nonaka, 1994, p.15).
37 According to Nonaka and Takeuchi who have a Japanese vision that tends to stress the tacit dimension, tacit and explicit knowledge are not totally separated but complementary entities. In the dynamic model of knowledge creation, human knowledge derives from the social interaction between tacit and explicit knowledge (Nonaka and Takeuchi, 1995, p.61).
The explicit knowledge instead is objective, it can be communicated to others, it can be processed and it is transmittable in formal language or numbers, but it is only the tip of the iceberg (see section 2.2) of all individual knowledge.

To communicate and share the tacit knowledge in the organization and in an industrial district it is necessary to convert it in language, number or artefact. It is during this time that organizational knowledge is created (Nonaka and Takeuchi, 1995, p.9).

The “organizational knowledge creation”, in their model, is ‘‘the capability of a company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, service and systems’’ (Nonaka and Takeuchi, 1995, p.3). It is the key to the company innovation. It is the same process that we have described for the industrial district in the previous section.

In 2007 Nonaka wrote:

<<In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge. When markets shift, technologies proliferate, competitors multiply, and products become obsolete almost overnight, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products. These activities define the “knowledge-creating” company, whose sole business is continuous innovation>> (Nonaka, 2007 p.162).

In other words, knowledge is the source that can be caught from the outside (Nonaka and Takeuchi, 1995), it is shared within the organization, stored in the company knowledge base and utilized in developing new technologies and products (Nonaka and Takeuchi, 1995; Nonaka, 2007). It is a continuous process: from outside to inside to outside again as a new product, process and service. We think that this process can be applied completely to a modern industrial district inserted in a global market and that the innovation cannot be only seen as process information deriving from outside for solving internal problem. The innovation can be seen as the outcome of the process of knowledge creation and, at the same time, a growth in new knowledge and information from inside to outside.

Their model is built up distinguishing two different dimensions of knowledge, the epistemological dimension and the ontological dimension. The ontological dimension is formed by the different
levels of knowledge: individual, group or social, organizational and inter-organizational knowledge. It consists of the conversion of knowledge from individual to group knowledge, from organizational to inter-organizational one.

The epistemological dimension is formed by the tacit and the explicit knowledge and it consists of the conversion of knowledge from tacit to explicit one and vice versa.

From this social interaction between tacit and explicit knowledge derives the “knowledge conversion” that is the principal assumption of the dynamic model of knowledge creation. As discussed in Chapter 2, considering that individual is never isolated and the social interaction are continuous, "...through this “social conversion” process, tacit and explicit knowledge expand in terms of both quality and quantity" (Nonaka and Takeuchi, 1995, p.61).

The creation of new knowledge as a source of competitive advantage starts with the personal and tacit knowledge held by individuals, which is transformed into organizational and inter-organizational knowledge that is explicit.

These transformations involve four modes of “knowledge conversion” and require five conditions, so that the knowledge is created through an organization and among the organisations (such as an industrial district).

The four modes are the following (Figure 6):

1. **Socialization** (from tacit to tacit) is for the transfer of tacit knowledge, in which the creation and sharing of this tacit knowledge corresponds to direct interactions among individuals as it happens in an industrial district.

   The key to acquire tacit knowledge is experience; for example, an apprentice who acquires knowledge through observation, imitation and practice, in a firm through the job training (Nonaka and Takeuchi, 1995, p.63), informal meetings, interactions with customers before and after product development. The essential role of social network is the reason why our survey focuses on the informal meeting number in a month and on the importance of demand-driven as a source of knowledge and innovation. Socialization involves the sharing of tacit knowledge through interactions, the diffusion of experiences, mental models and involves the creation of new perspectives.

2. **Externalization** (transformation of knowledge from tacit to explicit) happens when tacit knowledge becomes explicit in the form of a new concept and the use of metaphors or analogies that helps in the articulation of knowledge that is difficult to communicate. Figurative language and imagination are essential to this process (Nonaka and Takeuchi, 1995, p.66). A new product concept can be formed through socialization and externalization.
3. **Combination** (transfer of explicit to explicit knowledge) is the process of transforming a concept into a knowledge system, such as media, documents, meetings, computer networks prototype and ICT, included e-mail, Computer-Aided Design/Manufacturing (CAD/CAM), all of which can lead to new knowledge. The essential role of these processes is the reason why our survey focuses on the formal meeting number in a month, on the CAD/CAM use and on the prototype numbers. It involves people interacting and combining knowledge.

4. **Internalization** (transformation of knowledge from explicit to tacit) is the process of explicit knowledge becoming embodied in tacit knowledge in the form of mental models or technical know-how (Nonaka and Takeuchi, 1995, p.69). Documents, manual and oral stories can help this mode. It is associated with “learning by doing”, of internalizing experiences into tacit knowledge held by individuals.

Organizational knowledge is created when all four modes of knowledge creation interact in a continuous cycle: the tacit knowledge accumulated at the individual level needs to be socialized with the other members of organization. Organizational knowledge creation is a continuous and dynamic interaction between the sources of tacit and explicit knowledge. From this interaction the innovation emerges. Considering the Figure 7 the socialization starts with a field building of interaction that facilitates the sharing of individual’s experiences and mental model. The externalization is generated by dialogue with the use of metaphor or analogy and helps team to articulate tacit knowledge, hard to communicate. The combination starts with sharing the new and the existing knowledge in the organization, forming new product and service. Learning by doing causes the internalization (Nonaka and Takeuchi, 1995, p.70-71).
Now the epistemological and ontological dimensions, described before and presented in Figure 8, show how the spiral for the knowledge creation emerges when the tacit and explicit knowledge interact. This spiral is elevated from the individual level (lower) to an inter-organizational level (higher). The creation of new knowledge as a source of competitive advantage starts with the personal and tacit knowledge held by individuals. The organization must mobilize tacit knowledge and amplifies this latter through the four modes of knowledge conversion versus the higher ontological levels. This is the “knowledge spiral” where there is the interaction between tacit and explicit knowledge in which the four modes interact in the process of product development, for example. The creation of a product concept involves a community of individuals with different knowledge and experience. Socialization and externalization are necessary for shared individual’s tacit and explicit knowledge. The product is created through this collective and cooperative interaction (Nonaka and Takeuchi, 1995, p.73).
As we have remarked before, at the organizational level, five conditions must be fulfilled to promote knowledge spiral.

The first is the organizational intention, which can be compared to the aspirations of an organisation to reach its targets. The strategy adopted is to develop the organizational capability to acquire, create and accumulate knowledge.

The second condition is autonomy, that is, the autonomy to act in any way that may increase the chances of the organization acting on any opportunities that may be presented.

The third is fluctuation and creative chaos which stimulates interactions between an organization and its external environment. Fluctuation in an organization breaks down established routines and habits and helps to create new concepts and new knowledge.

The fourth condition is redundancy of information or the existence of information “that goes beyond the immediate operational requirements of organizational members” (Nonaka and Takeuchi, 1995, p. 80). The creation of organizational knowledge requires the creation of a concept by an individual or group that must be shared by other individuals for whom it may not be immediately applicable (Nonaka and Takeuchi, 1995, p. 81). The sharing of redundant information enables the sharing of tacit knowledge. Nonaka and Takeuchi give some examples of building redundancy including the “rugby-style” product, in which the product is divided into different competing groups that develop different approaches to the same project. There is also “strategic rotation” of personnel in particular among different areas of technology or functions (R&D and marketing) making organizational knowledge more “fluid” and easier to apply in practice.

The fifth condition is the variety or the organization internal diversity and flexibility which must match the variety and complexity of the environment.

This model and its hypotheses, which incorporate the time dimension, are divided into five phases:

1. Sharing of tacit knowledge which corresponds to socialization in which team members interact face to face to exchange individual tacit knowledge. They work together for a common target. Individual knowledge is amplified within the organization.
2. Creating concepts (externalization) which allows tacit knowledge to be converted to explicit knowledge in the form of new concepts expressed through words (codified).
3. Justification of these new concepts whereby the organization determines whether the new concept is worth of pursuing. The used criteria can be quantitative or qualitative.
4. The fourth phase involves the concepts being shaped into “an archetype” or something tangible such as a prototype – new product or new innovation – embodying new
corporate value, new managerial system, and new organizational structure. It is built by combining new explicit knowledge with existing knowledge.

5. Finally, the knowledge created must be extended “to others in the division across to other divisions, or even to outside constituents. These outside constituents include consumers, affiliated companies, competitors, universities and distributors” (Nonaka and Takeuchi, 1995, p.84).

4.4.1 A Critique to Nonaka and Takeuchi’s Model

Although we think Nonaka and Takeuchi’s model is the best developed in the literature about knowledge creation and diffusion, and Bratianu (2010) considers this model a new idea and a new paradigm for organizational knowledge dynamics and he explains that a new alternative paradigm has not yet been conceived, in this sub-section we want to point out this model limits.

In the literature, in fact, there are different contributions showing these limits (Adler, 1995; Essers and Schreinemakers, 1997; Jorna, 1998; Szulanski, 1996, 2000; Bereiter, 2002; Szulanski and Jensen, 2004), but we consider only Bratianu (2010) and Gourlay’s (2006) more recent critique and after we move on our critique.

The first is the assumption to consider knowledge as a “justified true belief” and as a dynamic human process of justifying personal beliefs. In this term, as noted by Bratianu (2010) and Goulay (2006), knowledge is a relative concept; its objectivity and its role in science are both excluded. It is the principal assumption of the model – because Nonaka and Takeuchi consider that the Western culture develops and enhances the explicit knowledge, while the Eastern culture develops the tacit knowledge. To this regard Bratianu writes:

<<The Nonaka’s model of knowledge dynamics in organizations can be very well understood and used in the context of Japanese culture, but it is unlikely to produce successful results in other cultures. The basic cornerstone is the concept of Ba [platforms for knowledge creation] which hardly can be understood in a culture where the Cartesian dualism produced such a gap between rational and non-rational worlds. Also, this concept is related to the Japanese specific interpretation of no-thing-ness38>> (Bratianu, 2010, p.195).

38To clarify this point, see Bratianu (2010). Considering Kaufman (1994), he writes: <<The spirit of no-thing-ness means that there is no such thing as relying upon anything at all outside of your individual mind>>
The existence of conceptual problems is emphasized by Gourlay (2006) too. In fact <<A model of knowledge creation processes that begins with tacit knowledge must therefore account in some way for both inherently and contingently tacit knowledge, an issue that needs addressing if Nonaka’s hypothesis about knowledge creation is to be defended>> (p.1422).

Gourlay (2006) also specifies the simplicity and at the same time the difficulties of the explanation of the conceptual framework which cannot support the empirical evidence that is much more complex.

Another NTM limit is in describing the four modes of knowledge creation process that <<…is blurring the lines between individuals and groups…[because the]… knowledge conversion from tacit to explicit and from explicit to tacit, according to the epistemological dimension is clearly a process developed at the individual level>>. At group level it is hard to explain as it works <<…because of the sequential interplay between strictly individual processes and group processes>> (Bratianu, 2010, p.195). Moreover the spiral of knowledge creation is a theoretical solution, but it is difficult to analyze in the case studies.

To this regard Gourlay (2006) critiques particularly the combination and the internalization modes because:

<<Both these processes are described as comprising a number of otherwise distinct activities, two of which (reading and writing) are common to both. What unites these otherwise disparate activities to qualify them as either (or both) combination or internalization is not made clear in principle, or through the examples. This unexplained empirical heterogeneity, together with the introduction of a new aspect, feelings, suggests a lack of conceptual clarity>> (Gourlay, 2006, p.1421).

In fact Gourlay (2006) observes that if <<new tacit knowledge is also generated by internalization, and if reading and writing are both instrumental in tacit knowledge formation, then knowledge creation might also begin with the creative synthesis of explicit knowledge (‘combination’). Externalization too could form a starting point since all that is required is that some ‘source’ activity, and thus associated tacit knowledge, already exists>> (p.1421). It is a source of confusion.
Considering Nissen’s model\(^{39}\) (2006) based on the NTM and on the knowledge flow model in which Nissen explains how knowledge moves through an organization with the time dimension and the life cycle, Bratianu (2010) observes the necessity to add the time dimension because knowledge moves from one person or from one organization to another in a flow time. This model considers, in fact, tacit knowledge as a slow flow with a long flow time and the codified knowledge a rapid flows and short flow time (Bratianu, 2010, p.196). In this perspective, socialization is a slow process because it involves the transfer of the tacit knowledge, while combination is a rapid process because it involves the transfer of explicit knowledge.

We begin from the last observation to remind that also for us the time dimension is very important because it transforms knowledge from an excludable, rival, private and personal good to an excludable but non-rival club good and in a long time to a non-excludable and non-rival public good as we have seen in Chapter 2. For this reason, to explain the NTM it is necessary to include the time when the model is applied to the industrial district.

The our second remark derives from the observation that in their model Nonaka and Takeuchi highlight that a knowledge-creating company does not operate in a closed system, but in an open system in which knowledge is exchanged outside. If we agree with this observation, it is necessary to observe that Nonaka and Takeuchi do not consider either the importance of the organization absorptive capabilities of Cohen and Levinthal (1989) or the individual “absorptive capacity” of Witt et al (2007) that we have considered in Chapter 2. In fact, the knowledge absorbed from outside depends on the organizational absorptive capabilities and on the individual “absorptive capacity”. In other words the NTM is an internal model. It is necessary to add the dynamic capabilities (see Chapter 3) because the firm or the organization is considered an open system, whose performance depends on the dynamic exchange with the external environment (Leoncini and Montresor, 2008), on the firm relations with its environment and on its organization. Moreover as we have clarified in Chapter 2 and in the previous section, the ability of firms to scan and develop their knowledge is influenced by the size of the firm, its experience, research activities, ties, location, human resource mobility, social and firm networks, observation for imitation, external and international relations. All these aspects are not considered in the NTM, but they can be added when the model is applied to the industrial district.

\(^{39}\)In this model Nissen integrates the Nonaka model with the time dimension and the life cycle. See Nissen (2006).
Another aspect that it is not specified in the NTM is that there are different typologies of knowledge and different characteristics. As we have seen in Chapter 2, for example, for Witt et al. (2007) the different characteristics consist of its tacitness or overtness on one side and its public or private good property on the other. Nonaka and Takeuchi’s model exemplifies two fundamental types of knowledge - explicit and tacit. The model does not consider, in fact, that different collaborating companies have different interests, the knowledge that they hold could be of different degree of tacitness, from the lowest degree to the highest one, and that the innovations they produce could be of different types, less or more complex.

Also, since the model was developed in 1995, the huge impact of ICT on tacit knowledge sharing in organizations was not envisaged as well as the interactions with the institutions and with the other firms.

They have also forgotten the importance of knowledge spillovers and the different typologies of spillovers. In fact as we have remarked in Chapter 2, it is true that the firm competitiveness depends on internal and external sources of knowledge in order to generate new knowledge, but it also true that all firms benefit from knowledge externalities or knowledge spillovers if the appropriability is high, the costs are low and the firms can produce more technological knowledge.

For our study based on the Italian industrial district, instead, Nonaka and Takeuchi’s perspective or in general the Japanese prospective to develop the tacit knowledge is particularly suitable because in the industrial district the tacit knowledge spreads easier for the face to face contacts, for the informal meeting that are widespread, for the high mobility of workers, for the imitation of innovation. On the contrary the NTM is not adaptable for the Italian firms when the importance of knowledge management is considered. In fact the Italian firms are small or very small, the management is absent, except for some larger firms as it will be better shown in the empirical case studies (Chapter 8).

Another problem is that the NTM is focused on interactions within a firm; the modern industrial district theory is referred to an agglomeration of small and medium size interacting businesses where the flows of external and internal knowledge are important particularly in a global market.
4.5 Application of Nonaka and Takeuchi’s Model to Industrial District

In this section, we explain why Nonaka and Takeuchi’s model is particularly appropriate for our study based on the industrial district.

In fact, it is possible to apply Nonaka and Takeuchi’s model to the industrial district because this model as we have seen in the previous section is based on the Japanese perspective. It develops particularly the importance of tacit knowledge and as it was pointed out in Chapters 2 and 3, within the industrial districts, knowledge and particularly the tacit knowledge spreads more easily. As in the NTM the interactive process among workers produces knowledge, so in the industrial district the continuous social networks and workers’ mobility create and diffuse knowledge. In fact the industrial district is characterized by strong ties (family ties and friendship ties) and weak ties or occasional ties (as we demonstrate in the empirical part) with suppliers, buyers, customers. These latters in a modern industrial district can be internal, external to the district and international. Differently from the NTM the firm networks are important channels of knowledge diffusion thought vertical and horizontal integration. Other characteristics are the firms and people with a homogenous culture that gives the possibility to diffuse rapidly new knowledge in the district. Cooperation exists between the local community and the firms of the district, among competing enterprises that divides the risks, stabilizes the market and promotes innovation. Important is also the human resource mobility or work mobility inside the district and outside the district if we consider the international relations. The assimilation and transformation of tacit knowledge into new knowledge and innovation depends instead on Social Capabilities.

An industrial district is in fact:

- a territorial agglomeration of small and medium size businesses interacting in a single production sector (Brusco, 1982; Becattini, 1979, 1989, 2000), where the flows of external and internal knowledge are important particularly in a global market;
- a place where individual firm knowledge is transformed into district knowledge, the district being characterized by common values, rules and language, where the knowledge is diffused and created in a pervasive and collective way (Giuliani, 2005) allowing the information and knowledge to rapidly circulate among the local actors and firms.
- the place where the apprentices learn their craft through observation and imitation from their masters. The place for a high degree of tacit knowledge, Social Capabilities and knowledge transfer and diffusion through interpersonal relationships, informal meetings, interactions.
with customers, suppliers, agents, workers’ mobility, social and firm networks, imitation i.e. socialization.

- an organization with the capacity to diffuse knowledge and innovation through its constituents and access and absorb external knowledge as a result of social interaction and dialogue (Nonaka, 1994), i.e. externalization.
- an organization with the capacity to combine explicit and external codified knowledge with local tacit knowledge, i.e. combination.
- the location for a process of learning by doing and using Social Capabilities, and embodying and applying knowledge in different contexts, i.e. internalization.

The industrial district can be considered a big organization that creates knowledge continuously as it is emphasized in Nonaka and Takeuchi’s spiral. Firms in industrial district benefit from access to a pool of skilled labour and new ideas. As long as district firms cooperate one with another, knowledge will circulate easily among firms, promoting processes of incremental and collective innovation (Giuliani and Bell, 2004). In other words, a vertically integrated organization is necessary, where the creation of a product concept involves the community of interacting individuals, firms and processes.

Nonaka and Takeuchi’s model could be applied to study industrial districts because in an industrial district, knowledge is created and diffused through some essential nodes (i.e. firms, suppliers, buyers, institution, research centers and universities). In this contest, the Social Capabilities assume a key role in the transfer and diffusion of tacit knowledge and for the creation of new knowledge and innovation as we have seen in Chapter 3 and as we verify in the empirical part of this work (Chapters 7 and 8).

The existence of leading firms in a district forms the hub of a modern district network. The weakest firms that lack specific capabilities may be somewhat isolated, but, as long as they have some capabilities, they will have access to the knowledge of other firms (Giuliani and Bell, 2005).

Economic geographers explain that it is the institutional and relational proximity that facilitates the diffusion of knowledge among firms and collective learning in district. Great emphasis is given to the role of social and relational proximity (Maskell and Malmberg, 1999; Amin and Cohendet, 2004). Other contributions have stressed the complexity of the productive process and knowledge transmission (Boschma, 2005; Capello and Faggian, 2002, 2005; Barrutia and Echebarria, 2010).
We have seen that the knowledge creation feeds the channels of knowledge transfer examined in the section 4.3. In turn the channels of knowledge transfer create new knowledge and they become determinant factors of innovation (Landry et al., 2002; Barrutia and Echebarria, 2010).

The degree of knowledge linkages with other firms depends on the similarities in the knowledge bases of these firms (Rogers, 1983, Lane and Lubatkin, 1998).

At the light of the considerations included in this chapter, within a district, knowledge diffusion and creation depends on:

- the quantity of knowledge accumulated over time;
- the workers’ mobility;
- the social and firms networks
- the imitation
- the capacity to decode, access and absorb knowledge from other firms inside or outside the district;
- the Social Capabilities to absorb and diffuse knowledge and to drive innovation.

All these channels of diffusion and creation of knowledge will be verified in the empirical part of the work.

4.6 Conclusion

In this chapter after describing how knowledge and innovation are created and diffused in a traditional industrial district and in a modern industrial district, we have highlighted the limits of the industrial district theory. These limits may be exceeded applying the NTM to the industrial district.

In fact the NTM underpins knowledge transfer and creation in the industrial district and it is used to explain the process of innovation creation through the process of organizational creation. But as we have remarked, this theoretical conceptual model presents some limits when used in this way. One of this is that the NTM is focused on interactions within a firm; the modern industrial district theory is referred to an agglomeration of small and medium size interacting businesses where the flows of external and internal knowledge are important particularly in a global market. This problem is solved considering the industrial district as a single and big firm or as a dynamic context with the capacity of promoting a knowledge conversion process. It is necessary to add that an industrial district in any case is a place of different interactions among active players to use Nonaka and Takeuchi’s “rugby” metaphor. They play in the “same field that diffuse and create knowledge”, but this field is open to international relations too. In fact the districts are the framework where
knowledge cycles take place, spread more easily due to continuous face to face relationships and the assimilation and transformation of tacit knowledge into new knowledge is continuous and depends on Social Capabilities.

In spite of any critiques, this model is considered a new paradigm for organizational knowledge dynamics and a new alternative paradigm has not yet been conceived (Bratianu, 2010).

We verify in the empirical part of this work the creation and diffusion of tacit and codified knowledge in an industrial district, where this diffusion depends on Social Capabilities.

In this way, with the questionnaire use we identify the internal and external relations among the different actors as a source of knowledge, we explain how the knowledge diffusion happens and we investigate if and how they are transformed into innovation through Social Capabilities (Chapters 7 and 8). To move to the empirical part, it is necessary to describe the empirical methodology to identify the sector, the categories and the districts object of our analysis (Chapter 5) and to analyse the economic context (Chapter 6).
CHAPTER 5

EMPIRICAL METHODOLOGY: THE CHOICE OF THE CASE STUDY

5.1 Introduction

In Chapter 4 we have illustrated how knowledge and innovation are created and diffused in an industrial district considering Nonaka and Takeuchi’s model particularly appropriate for our study based on the industrial districts.

In this chapter we describe the empirical methodology to identify the sector, the categories and the district, which are object of our analysis.

In other words, this chapter contains the empirical research methodology presentation for the choice of the case study.

Specifically we would like to answer these questions: why was the garment industry chosen for this study; why was a particular industrial district chosen in the Apulia region in Southern Italy; and why did we decide to study some types of products for 3 categories?

In this way (in section 5.2.1) we pay particularly attention to the evolution of the biggest concentration of small and medium sized enterprises (SMEs) in Italy and in textile (ATECO with code 17 in 2002 and with code 13 in 2007) and clothing (ATECO with code 18 in 2002 and with code 14 in 2007) sectors in the Southern Italy based on ISTAT (Italian National Statistical Institution) data (2001 and 2011), on Istat Report (2005), on the National Observatory of the Italian district Report (2012) and on IPI data (2008).

We identify the sector, the divisions and areas that will be the object of our case study in the Apulian Region in the Southern Italy and to fully understand the importance of the fashion industry we compare the industry classifications with the academic classification constructed for the purposes of this research. This latter is based on Pavitt’s taxonomy and Peneder’s tripartite classification (5.2.2).

We find the most important categories for product and we distinguish three categories (classic, innovative and traditional/fashion) for garment sectors on the basis of academic classification. We compare the two classifications and, remembering the Apulia fashion district specialization, we find the most important types of products for each category. For these types of product we look the names of the most famous companies in Italy into Yellow Pages and Kompass Database.

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40 ATECO is the Industrial Classification elaborated by the ISTAT (Italian Institute of Statistics).
At the same time for each specific product, we look for the firm numbers using Infoimprese database for Bari areas identified by the Istat industrial district classification 2001 and by the Apulia Fashion District. We compare the data to know the concentration of the most important products identified for each categories and areas of the case study. This is identified in a Special clothing district composed by Wedding dresses and Baby clothing. The conclusion is in 5.3.

5.2 The Case Study Approach

In this section we introduce the methodology about the choice of case study. We would like to justify the choice of the garment sector for this study; the Southern Italian area and particularly the Apulia Region, and the types of products to identify each category.

We use the ISTAT data (2001 and 2011), Istat Report (2005), the National Observatory of the Italian districts Report (2013) and the IPI data (2008) to identify the Italian industrial district numbers and the Southern Italy areas in the textile and clothing specialization. We use the ISTAT and Infoimprese data for the identification of sectors, divisions, categories and areas that will be the object of our case study in Chapter 7.

We compare industry classification and our academic classification to find the most important categories for product. To identify the company names we use Kompass and Yellow Pages data.

5.2.1 The Garment Industry in Southern Italian and Apulia Region

We begin with an Italian manufacturing description to explain why the garment industry was chosen for this study and why a particular industrial district was selected in the Apulia region in Southern Italy.

In this work taking into consideration the difference among district, cluster and network considered in the theoretical part (Chapters 2 and 4), we use the term of industrial district to catch the Italian definition of concentration/ dispersion of specialized firms in a specific territorial context.

The Italian manufacturing industry is characterized by a large number of small and medium firms, concentrated in a specific area. The district literature is very wide and this phenomenon has been studied by academic research (Becattini, 1979, 1989, 2000; Brusco, 1989,1991; Cainelli, 2002, 2003, Cainelli and De Liso 2004; Dei Ottati, 1992, 1995; Markusen, 1996; Guerrieri and Pietrobelli,

The attention also depends on the continuous evolution of the traditional industrial district caused by the changes in the Italian productive system. In fact ISTAT in 1991 identified in Italy 199 industrial districts and the methodology for the identification was rigorous. But this method excluded most important concentration of firms. In 1999 with a more flexible law the term of local productive system characterized by a low concentration of specialized firms was introduced. This new term excluded the reference to a geographical concentration and introduced the peculiarity of a homogeneous productive contest. In 2005 with the law n.266, a new concept of industrial system to point out the aggregation of specialized firms was introduced. In 2009, the industrial district becomes an open district for the external relationship that the market competition and the globalization process involve and for the embeddedness of external knowledge as we have remembered in Chapters 3 and 4. In fact the local origin and local networks remain in the industrial districts, but the networks involve more national and international areas, more regions, more provinces, more Countries. The meta-districts are born and it is necessary to redesign a new Italian map (Map.2 b). In 2011, in fact, Italy is divided in 4 meta-districts (4A), called clusters by Italian district Federation to adopt an international terminology. These 4 meta-districts of Made in Italy are classified in: clothing-fashion with 31 districts; automation – mechanic with 32 districts; goods for the house with 16 districts, agro-food with 15 districts and 7 high-tech districts (Italian districts Federation and Edison Foundation, 2013).

Moreover it is important to notice that, if for years, one of the most important problems about the Italian industrial districts has been the low level of innovation because the firms specialized in the traditional sector such as textile, garment, footwear, food, glasses, sofa, etc., reached a modest performance, studies such as those carried out by Cainelli and De Liso (2004), Cainelli et al. (2006) have demonstrated that also in the traditional sector an innovative performance exists. Particularly these works put in evidence that innovation is concentrated in the product innovation and firms evolve in new organizational forms such as the business groups.

The Italian districts in recent years have been fighting against the economic slump that still produces its effects and many were the attempts to respond to the 2008 crisis especially in terms of
repositioning and reorganization. The Italian industrial districts, in fact, strong in high expertise and specific know-how, in the innovation of product and process, in the ability to be competitive in foreign markets, have, however, important weaknesses. These weaknesses are identified in the low presence of an innovative service, in inadequate firm-bank relations, in the limited presence of new managers, in the policies of network to strengthen, in the formed small and discontinuous processes, in low organizational efficiency in family businesses of smaller size, in the limited use of network technologies and low investment in green technologies (National observatory of industrial districts, 2013, p131).

Innovation is carried out through the quality and controls for the quality of product and process, consisting of the application of the lean manufacturing (especially in fashion system), of the strengthening of logistics processes, of the direct control of distribution networks, of the product adapted to the customer’s needs, of the subcontracting relationships, as it occurs in the case of Italian fashion contractors that produce for foreign brands.

On the basis of a study conducted by Censis in 2012, aimed at studying the reaction of the last four years (2009-2012) of the business district to the 2008 crisis, it reveals a certain proactive firm district, although the crisis has also affected them. The analysis shows, in fact, that the 78% of the contacted firms has attempted to provide completely new products, the 75% to improve work procedures, the 69% has redefined the trade policies, the 65% has amended and adjusted the production plants, the 58% of the cases has replaced the corporate top managers. In the Italian districts, therefore, product innovation, included the radical type, remains the most popular (60% of the respondents by Censis), and the products are at the same time also improved. The 80% of businesses has replaced the machinery, the 81% has improved or innovated the network, and the 75% has improved the management system. The crisis has also stimulated the process innovation in such a way as to reduce the machining residues and to better use the raw material keeping the same quality of the products. This is just one of the ways started in the districts of the footwear, leather tanning and clothing. The data also show an effort directed toward the implementation of forms of "evolved innovation " (Observatory of Italian districts, 2013, p.139), not focused only on innovation of product and/or process, but aimed, as well, at the ICT use - from the use of internet to the use of the management platforms and business intelligence in order to exploit and use the information derived from the business activity -. From this analysis conducted by Censis in 2012, it comes out as the creation of knowledge and innovation in firm district is derived from a comparison with the outside and then from knowledge networks both formal and informal ones. Knowledge and innovation are then derived from formal collaborations with other firms, which do not belong to district, for 20% of the cases, from collaborations with universities or research centres in 12.5% of
the cases, following directions given by specialists and external consultants for the 27% of the cases, from a comparison with other external entities for 40% of cases, only for the 32.8% of the cases it was born within the firm.

Most of the industrial districts (see Map 1 for the regions and Map 2 (a) and Table 2 for the districts and regions) identified with the Istat data were localized in the North of Italy (Lombardy, Veneto, Piedmont, Trentino A.A., Friuli V. G.,) and in the Centre of Italy (Marche, Tuscany, Emilia Romagna, Umbria, Lazio), only few of them were situated in the South of Italy (Apulia, Abruzzi, Campania, Sicily, Sardinia and Basilicata). But if in 1991 ISTAT identified in Italy 199 industrial districts, in 2001 the number was 156.

The IPI (2008) identified 201 districts in 2008, in accordance with the laws n. 317 of 1991 and n.14/1999 that enables the possibility of identifying the industrial districts in the Region (Map 3). The National Observatory of the Italian districts identifies 101 industrial districts in 2011.

Despite the diversity of qualitative and quantitative data, the Regional distribution of industrial districts corresponds to the ISTAT data: more concentration in the North of Italy and in the Centre, less in the South (Tab.2).

Based on ISTAT Report (2005), in 2001 only the South of Italy registers an industrial district growth of 16.7% more than the one recorded in 1999. Instead the North and the Centre register a contraction. The cause of this reduction is explained in the reorganization of the firms that have decentred their production or have established district groups.

In 2001 the Italian industrial district specialization is the textile and clothing industry (28.8%), the mechanical industry (24.4%), goods for the house (20.5%), leather goods and footwear (12.8%). The districts of textile and clothing industry prevails (45). They are localized in Lombardy, Marche, Apulia, Tuscany and Veneto. In the North-Western Italy the textile industry prevails, in the rest of the Country the tailoring of coats or jackets districts.

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41 We analyse the ISTAT data because the IPI data are temporary. The definition adopted of industrial district by the National Observatory of the Italian districts is different from the one given to the ISTAT and it includes the only districts that are part of the National Observatory of the Italian districts (Table 2). This definition is not comparable with that given to ISTAT, but contextually the National Observatory of the Italian district data are the most recent data. For this reason, we first analyse the ISTAT data and then we pay our attention to the National Observatory of the Italian districts data for consider the recent evolution.
The districts of mechanics (38) are placed in nine regions: Lombardy, Emilia-Romagna, Piedmont and Veneto, Marche, Friuli-Venezia Giulia, Trentino-Alto Adige, Campania and Umbria (but with only one district).

The districts of goods for the house (32) are located in fourteen regions, and concentrated mainly in the Veneto and Marche. The other Regions have only one district with this specialization.

The districts specialized in the leather and footwear (20) are located in six Regions, mainly in Marche. After there is Tuscany and Veneto, while in Abruzzi, Campania and Apulia there is only one district.

Map 1 – Italy and Regions
**Map 2** - The Industrial District in Italy in 2001 (a) and the Italian meta-districts in 2011 (b) for industrial specialization

(a) 

(b) 

Source: Istat Report, 2005
Source: Italian District Federation, 2011

**Map 3** - The Industrial District in Italy in accordance with the Regional Law (December 2008) *

*5 regions have identified the districts*
Table 2 – Regional distribution of the industrial districts in Italy in 1991, 2001, 2008 and 2011

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a.v.</td>
<td>a.v.</td>
<td>a.v.</td>
<td>a.v.</td>
<td>a.v.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piedmont</td>
<td>16</td>
<td>12</td>
<td>27</td>
<td>7</td>
<td>-4</td>
<td>8</td>
<td>7,70</td>
</tr>
<tr>
<td>Valle d'Aosta</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Lombardy</td>
<td>42</td>
<td>27</td>
<td>16</td>
<td>12</td>
<td>-15</td>
<td>21,10</td>
<td>17,30</td>
</tr>
<tr>
<td>Trentino A.A.</td>
<td>4</td>
<td>4</td>
<td>.</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2,60</td>
</tr>
<tr>
<td>Veneto</td>
<td>34</td>
<td>22</td>
<td>44</td>
<td>22</td>
<td>-12</td>
<td>17,10</td>
<td>14,10</td>
</tr>
<tr>
<td>Friuli V. G.</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>1,50</td>
<td>1,90</td>
</tr>
<tr>
<td>Liguria</td>
<td>1</td>
<td>10</td>
<td>.</td>
<td>-1</td>
<td>0</td>
<td>0,50</td>
<td>.</td>
</tr>
<tr>
<td>Emilia Romagna</td>
<td>24</td>
<td>13</td>
<td>.</td>
<td>6</td>
<td>-11</td>
<td>12,10</td>
<td>8,30</td>
</tr>
<tr>
<td>Toscana</td>
<td>19</td>
<td>15</td>
<td>12</td>
<td>12</td>
<td>-4</td>
<td>9,50</td>
<td>9,60</td>
</tr>
<tr>
<td>Umbria</td>
<td>5</td>
<td>5</td>
<td>.</td>
<td>0</td>
<td>2,50</td>
<td>3,20</td>
<td>.</td>
</tr>
<tr>
<td>Marche</td>
<td>34</td>
<td>27</td>
<td>26</td>
<td>8</td>
<td>-7</td>
<td>17,10</td>
<td>17,30</td>
</tr>
<tr>
<td>Lazio</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1,30</td>
</tr>
<tr>
<td>Abruzzi</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>3,80</td>
</tr>
<tr>
<td>Molise</td>
<td>.</td>
<td>2</td>
<td>.</td>
<td>2</td>
<td>2</td>
<td>1,30</td>
<td>.</td>
</tr>
<tr>
<td>Campania</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3,80</td>
</tr>
<tr>
<td>Apulia</td>
<td>3</td>
<td>8</td>
<td>9</td>
<td>5</td>
<td>5</td>
<td>1,50</td>
<td>5,10</td>
</tr>
<tr>
<td>Basilicata</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>.</td>
<td>0,60</td>
</tr>
<tr>
<td>Calabria</td>
<td>2</td>
<td>1</td>
<td>.</td>
<td>-2</td>
<td>1</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Sicilia</td>
<td>.</td>
<td>2</td>
<td>23</td>
<td>4</td>
<td>2</td>
<td>.</td>
<td>1,30</td>
</tr>
<tr>
<td>Sardinia</td>
<td>.</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>.</td>
<td>0,60</td>
</tr>
<tr>
<td>Italy</td>
<td>199</td>
<td>156</td>
<td>201</td>
<td>101</td>
<td>-43</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>


In the South of Italy even if, as we have seen, the weight of district is still marginal in comparison to the rest of the Country, they have doubled their presence if we consider only the ISTAT data.

The region leaders of the South are: Abruzzi, Apulia and Campania. Apulia and Campania have increased the district number. In Molise two new districts are presented in the textile and clothing industry in the areas of Montenero di Bisaccia and Trivento where respectively 700 and 790 local units are located with 2,246 and 2,061 employees (Table 3). Giulianova, Teramo, Ortona are three areas of Abruzzi specialized in textile and clothing industry and there are other three areas – Montorio al Vomano, Pineto and Guardiagrele – the first two specialized in goods for the house and the last one in footwear -. In Apulia, instead, leader in the South for the textile and clothing districts, there are eight industrial districts: six in textile and clothing industry (Corato, Ceglie Messapica, Alessano, Presicce, Taviano and Veglie) one in footwear (Barletta) and one in good for the house (Altamura). In Corato and Taviano the most important concentration of firms and employees is
registered with respectively 4,903 and 3,640 local units with 15,555 and 8,992 employees. In Campania three districts are presented in the textile and clothing industry in the areas of Apice, San Marco dei Cavoti and Sant’Agata de’Goti; one mechanical district in Paternopoli area, one footwear district in Solofra area with 3,039 local units and 11,859 employees and one rubber and plastic district in the Buccino area. In Basilicata in the area of Pisticci there is an industrial district of rubber and plastic with 2,556 local units and 9,927 employees. In Sicily two districts are presented: one in goods for the house and one in textile and clothing industry. In Sardinia there is only one district in goods for the house.

Table 3 - Industrial districts in the South of Italy in 2001

<table>
<thead>
<tr>
<th>Regions</th>
<th>Areas</th>
<th>Specialization</th>
<th>N. Local units 2001</th>
<th>Employees 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abruzzi</td>
<td>GIULIANOVA</td>
<td>Textile and clothing</td>
<td>9,510</td>
<td>36,313</td>
</tr>
<tr>
<td>Abruzzi</td>
<td>MONTORIO AL VOMANO</td>
<td>Goods for the house</td>
<td>902</td>
<td>3,077</td>
</tr>
<tr>
<td>Abruzzi</td>
<td>PINETO</td>
<td>Goods for the house</td>
<td>3,377</td>
<td>11,938</td>
</tr>
<tr>
<td>Abruzzi</td>
<td>TERAMO</td>
<td>Textile and clothing</td>
<td>6,632</td>
<td>28,701</td>
</tr>
<tr>
<td>Abruzzi</td>
<td>GUARDIAGRELE</td>
<td>Footwear</td>
<td>1,698</td>
<td>5,766</td>
</tr>
<tr>
<td>Abruzzi</td>
<td>ORTONA</td>
<td>Textile and clothing</td>
<td>3,035</td>
<td>11,064</td>
</tr>
<tr>
<td>Molise</td>
<td>MONTENERO DI BISACCIA</td>
<td>Textile and clothing</td>
<td>700</td>
<td>2,246</td>
</tr>
<tr>
<td>Molise</td>
<td>TRIVENTO</td>
<td>Textile and clothing</td>
<td>790</td>
<td>2,061</td>
</tr>
<tr>
<td>Campania</td>
<td>APICE</td>
<td>Textile and clothing</td>
<td>350</td>
<td>926</td>
</tr>
<tr>
<td>Campania</td>
<td>SAN MARCO DEI CAVOTI</td>
<td>Textile and clothing</td>
<td>635</td>
<td>2,050</td>
</tr>
<tr>
<td>Campania</td>
<td>SANT’AGATA DE’ GOTI</td>
<td>Textile and clothing</td>
<td>1,522</td>
<td>5,208</td>
</tr>
<tr>
<td>Campania</td>
<td>PATERNOPOLI</td>
<td>Mechanics</td>
<td>449</td>
<td>1,371</td>
</tr>
<tr>
<td>Campania</td>
<td>SOLOFRA</td>
<td>Footwear</td>
<td>3,039</td>
<td>11,859</td>
</tr>
<tr>
<td>Campania</td>
<td>BUCCINO</td>
<td>Rubber and plastic</td>
<td>1,483</td>
<td>4,763</td>
</tr>
<tr>
<td>Apulia</td>
<td>ALTAMURA</td>
<td>Goods for the house</td>
<td>7,298</td>
<td>29,052</td>
</tr>
<tr>
<td>Apulia</td>
<td>BARLETTA</td>
<td>Footwear</td>
<td>22,966</td>
<td>73,283</td>
</tr>
<tr>
<td>Apulia</td>
<td>CORATO</td>
<td>Textile and clothing</td>
<td>4,903</td>
<td>15,555</td>
</tr>
<tr>
<td>Apulia</td>
<td>CEGLIE MESSAPICA</td>
<td>Textile and clothing</td>
<td>1,549</td>
<td>4,604</td>
</tr>
<tr>
<td>Apulia</td>
<td>ALESSANO</td>
<td>Textile and clothing</td>
<td>1,682</td>
<td>5,434</td>
</tr>
<tr>
<td>Apulia</td>
<td>PREGGIE</td>
<td>Textile and clothing</td>
<td>1,318</td>
<td>3,051</td>
</tr>
<tr>
<td>Apulia</td>
<td>TAVIANO</td>
<td>Textile and clothing</td>
<td>3,640</td>
<td>8,992</td>
</tr>
<tr>
<td>Apulia</td>
<td>VEGLIE</td>
<td>Textile and clothing</td>
<td>1,589</td>
<td>4,125</td>
</tr>
<tr>
<td>Basilicata</td>
<td>PISTICCI</td>
<td>Rubber and plastic</td>
<td>2,556</td>
<td>9,927</td>
</tr>
<tr>
<td>Sicily</td>
<td>CUSTONACI</td>
<td>Goods for the house</td>
<td>759</td>
<td>2,291</td>
</tr>
<tr>
<td>Sicily</td>
<td>SINAGRA</td>
<td>Textile and clothing</td>
<td>342</td>
<td>945</td>
</tr>
<tr>
<td>Sardinia</td>
<td>CALANGIANUS</td>
<td>Goods for the house</td>
<td>636</td>
<td>2,085</td>
</tr>
</tbody>
</table>

Source: ISTAT Report, 2005; ISTAT data 2001

The IV Report of the National Observatory of the Italian districts (2013) also evidences that, despite the crises of 2008, whose causes and effects we analyse in Chapter 6, on 22 districts localized in the South of Italy, leaders are the clothing districts that represent the 56% of total. In the South the food districts (17.5%) have a higher weight, while the districts of goods for the house and the engineering districts are less spread. The districts of engineering are concentrated in the North-
Western Italy (44%) and in the North-East of Italy the districts of engineering (27.5%) and of household goods (26%) are spread.

It emerges that both in 2001 with the Istat data and in 2011 with the National Observatory of the Italian districts data, textile and clothing industry plays an important role in the economy of these regions and the degree of specialization is high at territorial, regional and provincial level particularly in Apulia with 6 districts in 2001. It is necessary to add that, in 2010, in Apulia the Fashion district was formalized in accordance with the Regional Law 23/2007 (see Chapter 6 for more detail). It is for this reason that we have decide to explore the garment industry in Apulia.

In Apulia even if the rates of added value are negative in the manufacturing industry and in the textile and clothing industry between 2001 and 2004 for the strong competition of the emergent countries, the textile and clothing sector continues to have a good weight on the regional added value and an importance in terms of employees. In 2012, the National Observatory of Italian district, with regard to the textile and clothing industry in Apulia registered the presence of about 7,000 businesses and 38,000 active employees and estimated that 65% of “made in Italy” children’s clothing and 60-70% of wedding clothing are produced in the province of Bari. On the contrary in 2011 in Apulia and Provinces (Table 4), the number of local units and the employment in textile and clothing sector decreased, compared to 2001, for the effects of the financial crisis on the real economy and these areas are more exposed to external competition as it is better shown in Chapter 6. However, in 2011, the province of Bari, for the textile and clothing sector, and Barletta-Andria-Trani (BAT), Lecce and Taranto, for the clothing sector, remain the most important in Apulia.
Table 4 - Number of local units and employment in textile and clothing sector in Apulia and Provinces (2001 and 2011) with ATECO 2007

<table>
<thead>
<tr>
<th>Division/Area</th>
<th>N. local units</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
<td>2011</td>
</tr>
<tr>
<td><strong>13 Textile Industries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apulia</td>
<td>1,030</td>
<td>838</td>
</tr>
<tr>
<td>Bari</td>
<td>320</td>
<td>259</td>
</tr>
<tr>
<td>Lecce</td>
<td>225</td>
<td>223</td>
</tr>
<tr>
<td>Foggia</td>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>Taranto</td>
<td>48</td>
<td>47</td>
</tr>
<tr>
<td>Brindisi</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Barletta-Andria-Trani (BAT)</td>
<td>354</td>
<td>229</td>
</tr>
<tr>
<td><strong>14 Wearing apparel; dressing and dyeing of fur</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puglia</td>
<td>4,875</td>
<td>2,730</td>
</tr>
<tr>
<td>Bari</td>
<td>1,386</td>
<td>771</td>
</tr>
<tr>
<td>Lecce</td>
<td>1,216</td>
<td>654</td>
</tr>
<tr>
<td>Foggia</td>
<td>260</td>
<td>90</td>
</tr>
<tr>
<td>Taranto</td>
<td>389</td>
<td>257</td>
</tr>
<tr>
<td>Brindisi</td>
<td>213</td>
<td>130</td>
</tr>
<tr>
<td>Barletta-Andria-Trani (BAT)</td>
<td>1,411</td>
<td>828</td>
</tr>
</tbody>
</table>

Source: Istat, 2011

In fact the Apulia Fashion district brings together firms specializing in the manufacture of clothing for men, women, and children together with wedding ceremonial gowns. The associations, unions, bodies, universities and research centres (Confartigianato, Confindustria, 2010) are to be added to these. Three areas (Map 4) of specialization are also identified:

- The southern area of Bari/Trulli, including the towns of Putignano, Locorotondo, Castellana Grotte, Martina Franca, specializing in the production of outer garments (coats and jackets), children’s wear, bridal and ceremonial gowns (Map 4 in red).

- The northern area of Bari that includes the new Province of Barletta-Andria-Trani specialized in the manufacture of hosiery, underwear, sportswear and casual clothing (Map 4 in green).

- The area of Salento in Lecce, specialized in the casual wear, socks, shirts, ties and hats (Map 4 in blue).

We have chosen to select the southern and the northern areas of Bari because as we have seen considering the Table 4, the local unit number and employments prevail (See Tables 1A and 2A in Appendix A for more detail on local unit number and employees) respect to the area of Salento in Lecce.
As we have analysed, textiles and clothing are among the oldest manufacturing sectors in Italy and Apulia, but they are in decline because the market globalization, the international financial crisis of 2008 and the high competition due to emerging countries with low cost labour. The economic situation in Southern Italy and Apulia will be analysed in Chapter 6 as well as the Fashion district in Apulia.

In this context, we have chosen to study the garment industry for the following reasons: the Italian style, fashion and historically tradition is known in the world; it is a case where there is a concentration of small and medium firms; the historically presence of an high clothing and textile district number in the South of Italy and Apulia, the recognition of the Fashion district in Apulia in 2010, the division specialization is homogeneous; the economic area is characterized by very high levels of tacit knowledge, Social Capabilities and learning as the empirical part demonstrates.
5.2.2 The Choice of the Sector, Categories and Areas

In this sub-section, we identify the sector and the most important categories for product and areas in Apulia region in Southern Italy compared to the Industry Classification and the “Academic Classification”\textsuperscript{42} of clothing sector. The academic classification is based on Pavitt’s taxonomy\textsuperscript{43} (1984) and Peneder’s tripartite classification\textsuperscript{44} (2001). At the same time we look the name and the number of the “best” Companies into the Yellow Pages and the Kompass database to found the most famous Companies divided into categories in Italy and this exercise is useful to verify our choice.

For the division choice, it is important to consider the Table 5 where we analyse the number of local units and the employment in textile and clothing sector in Apulia and its provinces in 2011.

These data confirms that the clothing industry (division 14) is more important than the textile one (division 13). The only exception is for the local unit numbers in the division 13.9 (other textile industry) particularly localized in Bari, Lecce and BAT. This division includes the packaging of bed linen, table linen and furnishing and packaging of textile.

Considering the clothing industry, the local unit numbers and the employments are prevalent in Bari, Lecce, BAT and Taranto for the manufacture of leather clothes (14.1) with the outer garments for man, woman and child (14.13 and 14.13.1), tailoring (14.13.2), manufacture of underwear (14.14), manufacture of other wearing apparel and accessories (14.19 and 14.19.1) and manufacture of knitted, pullover, cardigan and similar articles (14.3 and 14.39).

\textsuperscript{42} This name derives from von Tunzelmann and Acha’s observation. They, in fact, do not consider the conventional classification as a high or low tech practiced by OECD useful for academic analysis (von Tunzelmann and Acha, 2006, p.409).

\textsuperscript{43} In 1984, Pavitt describes and explains differences among sectors based on the source, nature and impact of innovation. These differences depend on the sources of knowledge inputs, on the size and principal activity, on the sector of innovation production and main use (Pavitt, 1984, p.343). Pavitt’s taxonomy consists of three categories of industrial firms: supplier dominated, intensive production (scale intensive and specialized suppliers) and science based. The traditional manufacturing such as textiles, where most of innovation process comes from suppliers, is included in supplier dominated. This is characterized by small and medium size firms, low cost as a principal innovation object, the R&D is in house, innovation comes from suppliers and a key role is played by learning by doing and learning by using.

\textsuperscript{44} The Peneder’s tripartite classification (2001) of manufacturing industries is based on 3 levels of disaggregation. His taxonomy considers the intensity factor (labor –intensive, capital-intensive/marketing-driven, technology-intensive), the labour skills (low-skill, medium-skill blue collar and medium-skill white collar, high-skill) and the external service inputs (from knowledge-based service, from retail and advertising service, from transport service, from other industries). The Peneder’s classification appears to be more flexible because a lot of observable combinations are possible and it is able to take into account the observed empirical differences between countries and regions and the dynamic of industrial evolution.
Considering the 14.1, 14.13 and 14.13.1 we find that the most important categories are: jackets, each division in the Table 5. This is important because we want to know some categories of products include in the Table 5 considering the most important divisions that we have evidenced in the Table 5. This is important because we want to know some categories of products include in each division of the clothing sector (14). The source is ISTAT Classification with ATECO 2007.

At this point we build the Table 6 considering the most important divisions that we have evidenced in the Table 5. This is important because we want to know some categories of products include in each division of the clothing sector (14). The source is ISTAT Classification with ATECO 2007.

Considering the 14.1, 14.13 and 14.13.1 we find that the most important categories are: jackets, suits, wedding dresses, evening dresses, coats, skirts, trousers, dresses for ceremony, couture among

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Source: ISTAT, 2011

See the Appendix A for the code description

---

The 13 division is composed of 13.1, 13.2, 13.3 and 13.9. The 14 division is composed of 14.1, 14.2, 14.3
the main ones. If we consider the 14.13.2, the most important categories are: couture, couture wedding dresses among the main ones. For the 14.14, they are: t-shirt, shirts, slips, lingerie, pyjamas, underwear tailoring for man, woman and child. For the 14.19 and 14.19.1, they are: hats, caps, scarves, ties among the main ones. We include the 14.19.29 for the particular dresses, even if the local unit number is not high (179 in Apulia and 64 in Bari with respectively 1,318 and 353 employees). It includes sportswear, swimwear, ski suits, baby garments for example. While for the 14.3 and 14.39 they are: hosiery; pullovers, cardigans and similar articles.

Table 6 Industry classification of the most important clothing economic activities and categories in Italy based on ATECO 2007

<table>
<thead>
<tr>
<th>Classification</th>
<th>ITALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Worn apparel, dressing and dyeing of fur</td>
<td>Outdoor Clothing for man, woman and child</td>
</tr>
<tr>
<td>14.1, 14.13 and 14.13.1</td>
<td>Jackets</td>
</tr>
<tr>
<td>14.13.2</td>
<td>suits</td>
</tr>
<tr>
<td>14.14</td>
<td>wedding dresses</td>
</tr>
<tr>
<td>14.14</td>
<td>evening dresses</td>
</tr>
<tr>
<td>14.14</td>
<td>Coats</td>
</tr>
<tr>
<td>14.14</td>
<td>Skirts</td>
</tr>
<tr>
<td>14.14</td>
<td>Trousers</td>
</tr>
<tr>
<td>14.14</td>
<td>dresses for ceremony</td>
</tr>
<tr>
<td>14.14</td>
<td>custom tailoring</td>
</tr>
<tr>
<td>14.19 and 14.19.1</td>
<td>Outdoor Tailoring for man, woman and child</td>
</tr>
<tr>
<td>14.19 and 14.19.1</td>
<td>custom tailoring</td>
</tr>
<tr>
<td>14.19 and 14.19.1</td>
<td>wedding dress tailoring</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Manufacture of other wearing apparel and accessories</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Hats</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Caps</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Scarves</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Belts</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Ties</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>Manufacture of sportswear and others</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>Sportswear</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>Swimwear</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>Baby garments</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>ski suits</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>Manufacture of knitted and hosiery of pullover, cardigans and similar articles</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>Pullovers</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>cardigans</td>
</tr>
<tr>
<td>14.3 and 14.39</td>
<td>hosiery</td>
</tr>
</tbody>
</table>

Source: ISTAT classification with Ateco 2007
To fully understand the importance of the clothing industry, it was necessary to “eviscerate” it and not to consider only the statistically-encoded businesses. Adopting the conventional industrial classification\textsuperscript{46}, in fact, the analyst cannot catch the different production techniques for manufacturing processes required to create the final goods that differ from each other both according to the textile fibre used as well as to the quality, design, fashion and innovation, although the final product might appear very similar. In fact, although it is a low-tech sector, in the modern era, artificial fibres, such as the rayon, are to add to the natural fibres (cotton, wool, silk, linen). They are industrially manufactured from materials of vegetable or animal origin - for example the viscose – and they are used for underwear, shirts, clothing, satin and taffeta. Others are produced industrially from substances derived from petrochemical industries and they are synthetic such as the nylon and acryl with the Italian patent. Both artificial and synthetic fibres remain branches of the chemicals industry which the studies conducted using CAD and CAM recalling computerized technology must be added to. A lot of firms, however, prefer to use natural, certificate and non-allergenic fibres for the baby dresses because they certify the high quality, as the results of the survey demonstrates.

With the traditional industrial classification the analysts cannot catch the different sources of knowledge inputs and the different labour skills. As we have seen in the theoretical part of this contribution, knowledge comes from the internal and external firm relations, from social networks, from suppliers and buyers, from workers, from formal and informal meetings, from learning by doing, from learning by using, from artefacts, for example. In the clothing sector, general skills (medium-skill) which are also useful with other employers can prevail as it happens in some cases for the baby clothing district and specific skills (high-skill) that increase the productivity of the workers as it happens in the wedding district.

The importance of the clothing production process and the Social Capabilities importance for the industrial organization present in all the steps as well as the factor intensity (labour-intensive, technological-intensive, marketing driven) is not caught with the traditional industrial classification. Therefore, if we consider our academic classification (Table 7), based on Pavitt’s taxonomy (1984) and Peneder’s tripartite classification (2001), we distinguish three categories of clothing sector (classic, innovative and traditional/fashion)\textsuperscript{47}, at three level of disaggregation (weddings, outdoor

\textsuperscript{46} “Attempts to appraise innovation through adopting conventional sectorial classification can be quite misleading” (Von Tunzelmann and Acha, 2006 p.414)

\textsuperscript{47} When we consider academic classification, we highlight the importance of the clothing production process (Figure 9) and the Social Capabilities importance for the industrial organization present in all the steps.
garment, knit goods). We include the weddings in the classic category, where the innovation is low, the R&D and Design are developed in house, the labour-intensity process prevails, the workers have high and specific skills and the learning by doing is very important. The products are wedding dresses for women and in particular suits, underwear and dresses for ceremony for man, woman and child.

We include the outdoor garment in the innovative category, where the innovation is high, the R&D and Design is conducted in house and with external companies, the technology-intensity process prevails, the workers have high and generic skills. The goods are the sportswear such as tracksuits, jackets and the outdoor wear for man, woman and child.

We include the knit goods in the traditional/fashion category where the marketing-driven and the investment in design are very important, the process is fashion-intensive and the medium-skill white collar prevails. They are pullovers (cotton pullovers, woollen pullovers and cashmere pullovers), casual clothing and hosiery.

Knowledge and Social Capabilities are important sources of innovation in all three classifications.

We compare the industry classification (Table 6) to the academic one (Table 7) and remembering the Apulia fashion district specialization (see sub-section 5.2.1), we find the most important

---

**Figure 9 - The main phases of clothing production process**

<table>
<thead>
<tr>
<th>Production Process</th>
<th>Design, Innovation and Fashion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials</td>
<td>Cutting</td>
</tr>
<tr>
<td></td>
<td>Printing</td>
</tr>
<tr>
<td></td>
<td>Tailoring</td>
</tr>
<tr>
<td></td>
<td>Ironing</td>
</tr>
<tr>
<td>Working materials</td>
<td>Assembly</td>
</tr>
<tr>
<td></td>
<td>Packing</td>
</tr>
<tr>
<td>Marketing</td>
<td>Distribution and logistic</td>
</tr>
</tbody>
</table>

48 In this work, we use together R&D and Design, because we remember that the R&D includes three activities: basic research, applied research and experimental development. A basic research implies a more experimental or theoretical work; an applied research is a more practical work; an experimental development uses an existing knowledge derived from research and/or practical experience “...which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed”. (Frascati Manual, 2002, p 30) Some activities, such as design may contain an appreciable element of R&D, thus making it difficult to identify precisely what should or should not be defined as R&D. Investment in R&D and Design are utilized together because R&D represents only a single part of the innovation process. Quoting Oslo Manual (Eurostat, 2005), the innovation process includes also industrial engineering and industrial design (p18). In our case study, in fact design activity can be considered a more practical use of the research. This practical use requires the CAD and CAM use.
categories for product. They are: pullovers, outdoor wear, underwear, wedding dresses, hosiery and sportswear. For these categories we identify the most famous Companies in Italy (Table 8) thanks to the Yellow Pages and the Kompass Database. For example for the pullovers, the best companies in Italy are Armani in Milan, Max Mara Ltd in Reggio Emilia, Benetton Group Spa in Treviso and Maglificio Mariella in Barletta.

Table 7  Academic Classification

<table>
<thead>
<tr>
<th>Categories</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CLASSIC</td>
<td>Weddings:</td>
</tr>
<tr>
<td></td>
<td>Wedding dresses for women</td>
</tr>
<tr>
<td></td>
<td>Suits</td>
</tr>
<tr>
<td></td>
<td>Underwear</td>
</tr>
<tr>
<td></td>
<td>Dresses for ceremony</td>
</tr>
<tr>
<td>2. INNOVATIVE</td>
<td>(External) outdoor clothing:</td>
</tr>
<tr>
<td></td>
<td>Sportswear</td>
</tr>
<tr>
<td></td>
<td>Jackets</td>
</tr>
<tr>
<td></td>
<td>Tracksuits</td>
</tr>
<tr>
<td></td>
<td>Outdoor wear</td>
</tr>
<tr>
<td>3. TRADITIONAL/ FASHION</td>
<td>Knit goods:</td>
</tr>
<tr>
<td></td>
<td>Pullovers:</td>
</tr>
<tr>
<td></td>
<td>Cotton pullover</td>
</tr>
<tr>
<td></td>
<td>Cardigans</td>
</tr>
<tr>
<td></td>
<td>Woollen pullover</td>
</tr>
<tr>
<td></td>
<td>Socks</td>
</tr>
<tr>
<td></td>
<td>Cashmere pullover</td>
</tr>
<tr>
<td></td>
<td>Casual clothing</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jackets</td>
</tr>
<tr>
<td></td>
<td>Coats</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trousers</td>
</tr>
<tr>
<td></td>
<td>T-shirts</td>
</tr>
<tr>
<td></td>
<td>Shirts</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hosiery</td>
</tr>
</tbody>
</table>

The best companies for outdoor wear are Marina Yachting in Padua and Sartoria Ducale at Martina Franca. About the underwear, there are a lot of these (for example: Liabel and Arimo in Piedmont, Gruppo La Perla in Bologna, CST L’Intimo Italiano in Trani). The best companies for wedding dresses/dresses for ceremony are Acquachiara in Modena and Sbiroli at Putignano. About the hosiery the best are Ricamificio Gmg in Barletta and Bi-Emme Maglieria in Prato, GLMEL and MAFRA at Putignano. In the end, the best sportswear are EKE spa in Trani, and Confezioni R1G1Sport Ltd in Andria, H & H Sports Protection Ltd in Bergamo.

At the same time for the choice of specific products, we look the firms number into the Infoimprese database for Bari areas identified by the Istat industrial district classification 2001 (Corato) and by the Apulia Fashion District (Bari, Putignano, Martina Franca, Barletta, Locorotondo, Castellana Grotte, Trani, Andria). We compare the data in absolute value to know the concentration for the most important categories identified for man, woman and child.
We found (Table 9) 2,488 firms in hosiery sector (230 in Bari, 230 in Andria and 215 in Barletta), 600 firms in underwear sector (277 in Bari, 312 in Andria), 516 firms in sportswear/outerwear sector (53 in Bari, 19 in Andria, 18 in Barletta), 248 firms in wedding dresses (26 in Putignano and 21 in Bari) \(^{49}\).

**Table 8 - The most famous companies for category in Italy**

<table>
<thead>
<tr>
<th>Category</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pullovers</td>
<td>Industries SRL Unipersonal (PD)</td>
</tr>
<tr>
<td></td>
<td>Armani (Milan)</td>
</tr>
<tr>
<td></td>
<td>Max Mara srl (Reggio Emilia)</td>
</tr>
<tr>
<td></td>
<td>Dolce &amp; Gabbana (Milan)</td>
</tr>
<tr>
<td></td>
<td>CP Company (Prato)</td>
</tr>
<tr>
<td></td>
<td>Missoni (Milan)</td>
</tr>
<tr>
<td></td>
<td>Trussardi (Milan)</td>
</tr>
<tr>
<td></td>
<td>Benetton Group Spa (Treviso)</td>
</tr>
<tr>
<td></td>
<td>Maglificio Mariella (Barletta)</td>
</tr>
<tr>
<td>Outdoors wear/Sportswear</td>
<td>Marina Yachting (PD)</td>
</tr>
<tr>
<td></td>
<td>Biotex Ltd (Ravenna)</td>
</tr>
<tr>
<td></td>
<td>Basic Net Group (Turin)</td>
</tr>
<tr>
<td></td>
<td>Sartoria Ducale (Martina Franca)</td>
</tr>
<tr>
<td></td>
<td>Arena Italia spa (MC) Marche</td>
</tr>
<tr>
<td></td>
<td>Ludi Confezioni sportive (Martina F)</td>
</tr>
<tr>
<td></td>
<td>Sport Company Ltd (Barletta)</td>
</tr>
<tr>
<td></td>
<td>EKE spa (Trani)</td>
</tr>
<tr>
<td></td>
<td>Confezioni RLGI.Sport Ltd (Andria)</td>
</tr>
<tr>
<td></td>
<td>H &amp; H Sports Protection Ltd (Bergamo)</td>
</tr>
<tr>
<td>Underwear</td>
<td>Perofil (Bergamo)</td>
</tr>
<tr>
<td></td>
<td>Dolce &amp; Gabbana (Milan)</td>
</tr>
<tr>
<td></td>
<td>Liabel (Piedmont)</td>
</tr>
<tr>
<td></td>
<td>Gruppo La Perla (Bologna)</td>
</tr>
<tr>
<td></td>
<td>Arimo (BI) Piedmont</td>
</tr>
<tr>
<td></td>
<td>CST L’Intimo Italiano (Trani)</td>
</tr>
<tr>
<td></td>
<td>New Magic Dream (Andria)</td>
</tr>
<tr>
<td>Wedding Dresses</td>
<td>Acquachiara (Modena)</td>
</tr>
<tr>
<td></td>
<td>Shiroli (Putignano) on Kompass</td>
</tr>
<tr>
<td></td>
<td>Ritratti di Val &amp; Max (Putignano)</td>
</tr>
<tr>
<td></td>
<td>Le Spose di Gio’ (Milan)</td>
</tr>
<tr>
<td></td>
<td>Vemar Ltd (Putignano)</td>
</tr>
<tr>
<td></td>
<td>Valentini (Putignano)</td>
</tr>
<tr>
<td></td>
<td>Val &amp; Max Sposa (Putignano)</td>
</tr>
<tr>
<td>Hosiery</td>
<td>IGAM (Bari)</td>
</tr>
<tr>
<td></td>
<td>Confezioni Ita (Barletta)</td>
</tr>
<tr>
<td></td>
<td>Ricamificio Gmg (Barletta)</td>
</tr>
<tr>
<td></td>
<td>Bi-Emme Maglieria (Prato)</td>
</tr>
<tr>
<td></td>
<td>GIMEL (Putignano)</td>
</tr>
<tr>
<td></td>
<td>MAFRA (Putignano)</td>
</tr>
<tr>
<td></td>
<td>Pinco Pallino (Bergamo)</td>
</tr>
<tr>
<td></td>
<td>Benetton Group (Treviso)</td>
</tr>
</tbody>
</table>

Source: Yellow Pages and Kompass Database, 2011

\(^{49}\) It is necessary to specify that it is an unofficial source through which one can get an idea of the phenomenon in question. The activity description appears in the items. In other words the firms can be a centre of production and/or a commercial activity too.

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### Table 9 - Firms number for the most important category in some Apulia areas

<table>
<thead>
<tr>
<th>Areas/Categories</th>
<th>Pullovers</th>
<th>Hosiery</th>
<th>Wedding Dresses</th>
<th>Underwear</th>
<th>Sportswear/Outerwear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apulia</td>
<td>53</td>
<td>2488</td>
<td>248</td>
<td>600</td>
<td>516</td>
</tr>
<tr>
<td>Barletta</td>
<td>20</td>
<td>215</td>
<td>1</td>
<td>62</td>
<td>18</td>
</tr>
<tr>
<td>Corato</td>
<td>0</td>
<td>36</td>
<td>4</td>
<td>49</td>
<td>12</td>
</tr>
<tr>
<td>Martina Franca</td>
<td>1</td>
<td>45</td>
<td>4</td>
<td>57</td>
<td>9</td>
</tr>
<tr>
<td>Putignano</td>
<td>0</td>
<td>26</td>
<td>21</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Bari</td>
<td>4</td>
<td>230</td>
<td>21</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Trani</td>
<td>0</td>
<td>29</td>
<td>3</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>Andria</td>
<td>0</td>
<td>213</td>
<td>4</td>
<td>312</td>
<td>19</td>
</tr>
<tr>
<td>Locorotondo</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Castellana Grotte</td>
<td>1</td>
<td>15</td>
<td>8</td>
<td>18</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Infoimprese, 2012

### Outline 4 – Areas, types of products and categories of product for man, woman and child

<table>
<thead>
<tr>
<th>AREAS in Apulia</th>
<th>4 Types of product</th>
<th>3 Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barletta, Bari, Andria, Martina Franca</td>
<td>Hosiery (Pullovers)</td>
<td>Traditional/Fashion</td>
</tr>
<tr>
<td>Putignano, Bari</td>
<td>Wedding Dresses</td>
<td>Classic</td>
</tr>
<tr>
<td>Bari, Martina Franca, Andria</td>
<td>Underwear</td>
<td>Classic</td>
</tr>
<tr>
<td>Bari, Andria, Martina Franca</td>
<td>Outerwear/Sportwear</td>
<td>Innovation</td>
</tr>
</tbody>
</table>

Now we have all the elements to identify the areas, the types of products and the categories of products for man, woman and child useful to identify our case study (Outline 4). In fact, if we consider our tripartite classification with the types of product and the areas where there is the most firm concentration, we identify two cases of specialization in the Apulia region: the wedding dress district and the baby clothes district that together form a “Special industrial district”.

The case of wedding dresses is a good example of classic categories and the province of Bari with its southern area including the town of Putignano produces 60-70% of the wedding dresses that are certified as being “Made in Italy”.

The case of the baby dresses is a good example of innovative and traditional/fashion categories and this case includes the follow categories: hosiery (pullovers), sportswear/outerwear, ceremonial dress. This case includes the southern area of Bari, with the towns of Putignano, Locorotondo, Castellana Grotte, Martina Franca, and the northern area of the Bari basin with Barletta and Andria.

It is necessary to specify that in these areas we have a good firm concentration, but, as we see from our two case studies the areas are more than those mentioned because not all surveyed firms are part of the Apulia fashion district.
5.3. Conclusion

The empirical methodology developed in this chapter is important to understand the choice of case study, the selection of districts, areas and categories of products object of our study on the base of the tripartite academic classification.

In this chapter we have highlighted the continuous evolution of the traditional industrial district caused by the changes in the Italian productive system and by the strong competition of the emergent countries where the cost of labour is low. In the South of Italy even if the weight of districts is still marginal in comparison to the rest of the Country, they have doubled in presence, but the effects of the crisis have brought a further slowdown in the southern Italian economy in general, and in the Apulian one in particular (the discussion on the economic situation in southern Italy and Apulia is in Chapter 6).

Comparing a different data source we have chosen to study the garment industry in the Apulia region because the Italian style, fashion and tradition is known in the world and in the economic area, there are eight industrial districts: six in textile and clothing (Corato, Ceglie Messapica, Alessano, Presicce, Taviano and Veglie) one in footwear (Barletta) and one in goods for the house (Altamura). It is interesting to note that, in addition to these six areas, it is possible to identify other important and specialized garment areas such as Putignano, Bari, Barletta, Andria, Castellana Grotte and Martina Franca. In fact clothing is the oldest manufacturing sectors in Italy and Apulia, it is characterized by very high levels of tacit knowledge, Social Capabilities and learning, the flip side of innovation and in 2010 the Fashion district in Apulia was formalized In order to catch the important role of the fashion industry, it was necessary to “eviscerate” it considering not only the statistically-encoded businesses, but also our academic classification. As a matter of fact, researchers cannot understand the different production techniques that manufacturing processes required to create the final goods which differ one from another not only for the textile fibre used but also for quality, design, fashion and innovation, even if the final product looks very similar.

Therefore, to highlight the relationship existing between innovation and Social Capabilities, we chose our sample from the three categories, classical, innovative and traditional/fashion of the following goods. In the first category, we include women wedding dresses, ceremonial dress and underwear. In the second, outdoor garment, we include sportswear such as tracksuits, jackets and the outdoor wear. In the third knit goods, we include pullovers (cotton pullovers, woollen pullovers and cashmere pullovers), casual clothing, and hosiery.

The identification of the best company is important because some of these firms, even if small, are famous, very dynamic as they serve a wide range of local and national customers and suppliers.
located in Northern Italy in order to provide fabrics and, in particular, the suppliers for polyester being located in Veneto, Lombardy and Tuscany for cottons together with Prato and Biella for linens and wools.

In the next chapter we discuss the economic situation in southern Italy and Apulia, focusing in particular on the Apulian fashion district which represents one of the success stories in terms of its number of employees and turnover (Chapter 6).
CHAPTER 6:

A PICTURE OF THE SOUTHERN ITALIAN AND APULIAN ECONOMY. THE FASHION DISTRICT IN APULIA

6.1 Introduction

In the previous chapter, we have described the empirical research methodology for the choice of our case study: the Special clothing district composed of wedding dress and baby clothing districts. These are part of the Apulia Fashion District recognized in 2010. This chapter aims at discussing the economic situation in Italy and particularly the economic situation in southern Italy and Apulia and at describing the evolution of the industrial district with particular reference to the Apulia Fashion District. It is important to consider this aspect because the period (November 2011- January 2012) when our empirical analysis was carried out is very particular. In fact the Italian economy, although in difficulty since 2000, has been seriously affected by the 2008 international financial crisis and the European sovereign debt crisis. In this scenario characterized by the European and Italian clothing market restructuration, we focus our attention on the evolution of the industrial district with particular reference to the Apulia Fashion District recognized in 2010.

We begin the discussion with a presentation of the significant change that Italian economy, southern Italian economy and Apulian one have undergone (section 6.2) due to external and internal events. Nevertheless, the fashion system in Italy continues to play a leading role, despite being the most exposed to the competition with declining exports and internal demand. Our attention in section 6.3 is paid to the industrial district evolution and reorganization and to the Italian fashion industry that, historically, is one of the sectors that have contributed mostly to the Country economic growth. In the section 6.4, we focus our attention on the Apulia Fashion district which represents one of the most successful stories in terms of firm reorganization, number of employees and turnover. In the 6.5 there is the conclusion.

6.2 The Southern Italian and Apulian Economy: Some Notes

In this section we describe the economic situation in Italy and particularly in the South of Italy and in Apulia region that we have chosen as areas of our case study. This description is particularly
important in this work because it is necessary to understand the economic situation in Italy, Southern Italy and in the areas chosen for our case study.

It should be remembered that since 2000 Italy has seen a slowdown in growth together with major changes and restructuring of the industrial district due to events, both external and internal to the district. External events, linked to the globalization and entrance into the Euro area, have had a significant impact on the field of Italian productive and specialization, that since 1900 had reflected the performance of the secondary sector on the whole, representing about three-quarters of industrial employment (Giannetti and Vasta, 2005), but at the same time it proves to be more exposed to competition. Internal changes linked to the labour market reform and to the state intervention reduction have interacted with these factors.

Three crises, the first on September 11th 2001, the Twin Towers terroristic attack date, the second, a financial crisis that erupted in 2008 and that led to the third crisis regarding the European sovereign debt crisis have to be added to these two events. The financial crisis, in fact, is reflected on the actual economy, because the lower availability of liquidity weighs on consumption and the investment are not supported by positive expectations of profit in a climate of general distrust. Various measures to contain the crisis have been taken, from the actions carried out by Central Banks, to the increase in public spending, which, for some countries, means a substantial risk of default. The effects of these two last crisis last up to November 2011- January 2012 that corresponds to the period in which we have conducted our empirical analysis.

In order to better understand the economic situation in Italy, in Southern Italy and in Apulia during the period of the empirical survey, it is useful to start from 2008, in the year of the financial crisis diffusion that started in the United States in 2007.

The Italian GDP, in 2008, was reduced by 1.3%, household consumption fell to 0.8% and gross fixed capital investments to 4% (Bank of Italy, 2010). The situation worsened in 2009 with GDP recording a fall of 5%, consumption reduction by 1.7% and investment falling of 12.1% (Bank of Italy, 2010). In 2009 the decrease recorded was 2.99% and in the second half of 2009, the economic picture improved with increasing business and household confidence. The year 2010 ended with a GDP growth of 1.3%, which, however, corresponds to a modest recovery of what was lost during the crisis. The first months of 2011 show sign of a recovery, but the financial strains in Greece, Spain and in Portugal are still shaking the markets and the actual economy still seems to be slow (Bank of Italy, 2012). The recession starts in the second half of 2011 and in 2012 the GDP is also reduced by 2.4% when compared with 2011 (Bank of Italy, 2013).

Exports of goods and services are reduced in the years 2010, 2011 and 2012, registering an 11.4%, a 5.9% and a 2.3% being affected by the contraction of European demand. The imports also are
reduced with percentage shares respectively equal to 12.6%, 0.5% and -7.7%, reflecting the contraction of the internal demand (Bank of Italy, 2013).

The worsening of the economic activity has had its effects in the labour market. Between April 2008 and March 2010 employment fell to 815,000 units, returning to the levels of early 2006. The unemployment rate, rising steadily from the first half of 2007, in March of 2010 reached 8.8%, returning to the levels of 2001 and, in the age group 20-34 years, rose up to 2% (Bank of Italy, 2010).

If in the first years of crisis, the rise in unemployment appears less than expected, as there is a more limited labour supply, due to the exit from the market of those discouraged from looking for a job, in the last considered years, 2011-12, because of the extending of the recession, the occupational research increases. This means an increase in the rate of unemployment (Bank of Italy, 2013).

On the basis of the ISTAT data (2012), in the month of December 2011 the unemployment rate is equal to 8.9%, a peak that is not reached since 2004. The unemployed are 2,243 thousand, 20 thousand units more than in November of the same year. A young man out of three is unemployed even if the unemployment rate is reduced of 0.2% from November, registering a + 5.1% for the male component and a -3.9% for females.

The unemployment rate, in 2012, doubled (10.7%) compared to 2007. The increase in the unemployment rate has continued to be particularly marked among the young people of age group between 15 and 24 years (35.3 per cent, from 29.1 in 2011) (Bank of Italy, 2013).

Within this scenario, the Southern economy, already in trouble and always late in terms of growth, appears to have slowed down even more. If we dwell for a moment on the data, we can see that the gap between the two geographical areas (the South and the North of Italy) widens even more, precisely in terms of employment and unemployment. In 2009, in the South, 194,000 people (145,000 men and 49,000 women), of which 125,000 were young people between 15 and 29 years old, lost their jobs and, in addition, the remaining workers were less protected. In fact, against the 186,000 jobs lost in the North, 438,000 people benefited from state-subsidised employment, while in the South of the more than 200,000 employees less than 96,000 were protected in this way (SVIMEZ, 2010). The state-subsidized employment grows of 1.2% in 2012 in the South and of 5% in the rest of Italy (SVIMEZ, 2013). In 2011 and 2012 the unemployment rate is respectively of 13.6% and 17% in the South, of 6.3% and 8% in the Centre-North of Italy (SVIMEZ, 2013). By examining the area data (ISTAT, 2012) for 2010 and 2011, we note that in the South (Fig.10), the
GDP is reduced respectively of 0.1% and 0.3%, set against a fall to 2.78% in 2009 and to -2.3 in 2012, but well below of the growth recorded in the Centre-North equal to 1.7% in 2010, 0.6% in 2011. Within the South, the regions achieving the smallest decrease are Campania and Molise, followed by Apulia, Calabria, Abruzzi (SVIMEZ, 2013).

The economic fortune of southern Italian in general and the Apulian one in particular followed the growth and the decrease in the Italian GDP (Fig. 10), even if in Apulia economy the contraction is less than southern Italian. In 2011, on the contrary, the Apulian GDP is slightly increased (0.7%) and even more than the one in the rest of Italy (0.4%) and the one in Southern Italy (-0.3%) (Bank of Italy, 2013). In general, in 2012, instead, if the Italian GDP has seen a slowdown in growth of 7% when compared with 2007, in the South it is of -10% and in Apulia of -6% (Bank of Italy, 2013). This decline has impacted on the labour market in Apulia, too.

If we take a quick look at Apulian economy, it can be noted that in 2009 the regional GDP decreased to 3.25% and employment dropped by 3.8%, at a faster pace than the average for the entire southern sector, while the unemployment rate stood at 12.6% with an increase in both the use of state-subsidised employment, and in the inactivity rate (Bank of Italy, 2010). In 2012 the Apulian GDP declined by 2% after being slightly up in 2010 and 2011 (Bank of Italy, 2013).

At the same time, the labour market presents a different result if we consider ISTAT data: in fact although the employees’ number is stable, the number of hours worked has decreased due to the increase of part-time job and of workers in layoff (a period of worker’s temporary inactivity). This is accompanied by an increase in female employment to compensate the reduction in the total family income.

Figure 10- Annual percentage variations in Italian, southern Italian and Apulian GDP (2007-2012)
By analysing, in particular, Apulia export data, this shows that during the past decade, this grew less than the other Italian regions which, in turn, had already a little weight in world trade terms. Against an export decline (Bank of Italy, 2011) by 25% in Italy in 2010, Apulia, on the contrary, (which in February 2008, was characterised by a peak in exports and followed in July 2009 by a drop by -28% of the exports) witnessed a drop by -28% of the exportations, which becomes a +28% if we look at the data up to December 2010.

This data, both negative and positive, can be ascribed to the trends in exports of capital goods and intermediates, while non-durable consumer goods contributed to the recovery to the tune of 26.4%. The sectors that in 2010 recorded an increase in sales abroad, for about one quarter of the total, included chemical and pharmaceuticals, steel and mechanical, while almost 35% was contributed by foodstuffs, leather, leather-working and footwear. The main export markets for Apulia are EU countries, with Germany on the top, followed by France. Markets in the BRIC countries represent a very small share of total Apulian exports and during the worst of the crisis, there was a significant decrease in sales (-26.3%), and in the timid recovery which took place in the course of 2010, the increase was only 2.2% (Bank of Italy, 2011).

Sales abroad of goods have recorded, in 2011, an increase of approximately 18% at current prices, to an extent greater than the national average, and the Southern one, but with a sharp slowdown in the last quarter (Bank of Italy, 2012). The increase in export has concerned in particular the mechanical sector and pharmaceutical field, but it was not extended, however, in the same measure to the sectors of the "made in Italy" (clothing, skins and mobile) (Bank of Italy, 2012).

In 2012 the “made in Italy” continues to lose shares in the foreign markets, although a number of sectors as mechanical production, food, transportation and chemical-pharmaceutical products showed increases.

The clothing sector, where competition is high due to emerging countries with low cost labour, records a decline in domestic demand and a reduction in consumer spending in 2011 and 2012 (Bank of Italy, 2013). The share of expenditure of the Italian families intended for the purchase of clothing and footwear shrinks from 5.4% in 2011 to 5% of 2012 in Italy and in the Southern Italy from 6.6% to 5.7% (ISTAT, 2013). According to the ISTAT survey, not only 22% of the Southern Italian families reduces the amount of clothes and shoes purchased, but they are oriented toward a lower quality and such a purchase often takes place in a street market (from 12.4% to 17% in the South and from 11.1% to 13.6% at the national level).

In this context the clothing market appears stagnant, but some firms, as the case study shows in Apulia region (see Chapter 7), react by adopting strategies based on incremental and/or radical innovation of products, processing, marketing and reorganization. In any case, the district
enterprises stake on their specific skills, the tacit knowledge and the Social Capabilities and in their competitiveness on the foreign markets.

At this regard it is important to think about the industrial district evolution where the geographical proximity has given way to the dispersion one, transforming the industrial district, as well as to consider the Apulia Fashion district as a result of this reorganization.

6.3 The Industrial District Evolution: Some Notes

In this section we consider the industrial district evolution and reorganization, because of the changed international scenario departing from 1970s. The need, starting in the 1970s, to change the markedly Fordist organization that, especially in the basic production of final goods, and services, favors the large operations taking advantage of economies of scale, represents the new beginning of the industrial districts.

The high capital intensity of the manufacturing processes, and, therefore, the significant influence of fixed costs when compared to variable ones, led, in previous years, to the adoption of a strongly vertically-organized corporate structure. During downturns in demand, it is considered preferable to internalize some work processes even if the market provides more technologically efficient ones as a result of the greater specificity of the factors required in the manufacture of a good, as the market raises transaction costs and makes its acquisition on the market less demanded.

Subsequently, because of the changed international scenario, it is believed that the benefits associated with economies of specialization are greater than those of scale, and there is outsourcing of production processes with the intermediate inputs being acquired on the market to reduce transaction costs with a rise in the overall number of companies throughout manufacturing (Brusco and Paba, 1997). The change in organization from hierarchical to polyarchical type (Arrighetti and Traù, 2006), obviously attributable to the uncertainty in demand related to product differentiation, leads to the proliferation of small businesses with enhanced production specialization, often located in the same area. This change in the organization of production has originated the industrial districts, which are not to be identified as an agglomeration of firms resulting from a process of relocation, as inside them the tacit and codified knowledge are combined, and as a consequences they lead to the localized knowledge (Antonelli, 1996, 1999; Metcalfe, 1999) that is not easily imitable and constitutes their success. The firms, in fact, accumulating direct experience of manufacturing techniques over time, learning from their mistakes, interact with suppliers and customers and sharing the information gathered, are able to produce increasing returns of factors.
The larger is the existing range of knowledge and skills among interdependent firms located in the same area, the lower is the risk of generating technological discontinuity when introducing innovation. Indeed, firms are induced to innovate not only by the pressure exerted by demand, by the market structure where they operate, by the availability and by relative prices of various factors, but also by the skills they have that constitute the intangible factor which can bring out the positive effects of the adoption of an innovation.

Since the late 1990s we have seen a change of direction and the fourth stage of Italian capitalism has begun to take shape (Colli, 2005), in the sense that there has been an increase in the size of some firms, even if they are not located within the districts. A change of organization, seemingly with hierarchical contours has followed the change of direction. This transition from small firms with unique legal status to the medium-sized ones, set within a group structure, of which they are the parent or subsidiary, may be related to the significant fixed costs, which have to be supported to take advantage of new technologies and to comply with ever more stringent and rigorous environmental legislation. In addition, we should not underestimate the enormous broadening of the markets, both for intermediate and final products, where many players are involved, making the competition more and more pressing. The constant call to produce innovations implies a commitment to investment in R&D and in human capital that the small business is unable to perform, because the excessive miniaturization of its manufacturing apparatus has eroded its ability to continue to accumulate the tacit knowledge that constituted the strength of many local units. Analyzing the upstream part of the production chain, and in particular, the one related to the supplier companies, it is plain that they have undergone a considerable increase in costs caused by the high degree of product differentiation, the only weapon to beat the competition. Taking into account that the combinations of inputs that allow the manufacture a range of different products, are many and varied, the suppliers are forced to change their organization (Sturgeon and Lee, 2004; Frigant and Talbot, 2005), in order to be able to offer functions and powers to their buyer businesses, including those related to quality and financial management that are more related to the range of services on offer than to the strictly manufacturing one. It should be stated that medium-sized firms, with their expertise being not only productive, but also logistical, commercial and financial, represent the link between the large final business customer and the many smaller units involved in various phases of the production process.

On the other hand, inter-firm relationships are not only determined by market imperfections and control mechanisms, analyzed by transaction cost theory, as much as by their own internal
resources, by the resource-based view, justifying joint ventures, partnerships or any other forms of inter-firm relationship. The analysis of governance and performance of a firm does not have, as its focus, external factors such as, for example, the structure of the sector, in which it operates, but those variables, mostly the intangible ones, peculiar to the firms themselves. Each firm, in fact, has a set of tangible and intangible resources (Penrose, 1959) that means that it differs from the others and that, properly exploited through the adoption of specific strategies, enables greater profitability. The skills that distinguish one firm from another can be understood as the sum of:

- activities that it is able to do better than others (Selznick, 1957);
- organizational routines (Nelson and Winter, 1982), i.e. its capacity for coordinated actions;
- the tangible and intangible processes of every business arising from the interactions among resources (Amit and Schoemaker, 1993):
  - its dynamic capacity to be able to change, constantly renewing itself (Teece and Pisano, 1994);
  - skills that generate a differential if they have strategic value, they are rare and difficult to imitate or substitute (Hoopes et al., 2003).

In the case of the Italian industrial districts, firms not only earn external economies, identifiable in low transaction, production and innovation costs, but also from the ability to obtain a range of results from the set of skills and resources, which each of them has. Therefore promoting these agglomerations means acting through such local policy measures which, however, should not translate into local political actions, but they should be targeted, taking into account both the specificities of each area and the links creating interdependence, thus to generate development.

The Italian districts are business systems which are small on average, located in the same area, implementing forms of cooperation, producing and disseminating knowledge, almost forming a single manufacturing system, which, taking into account the diversity, can be compared to a large enterprise. Albeit slowly, within these systems, the medium-sized firm is establishing itself, operating in the “Made in Italy” fields ranging from food to fashion, but also in the chemical and pharmaceutical industries, the mechanical sector, both for capital goods (industrial machinery, electrical and electronic equipment), and components (fixtures, fittings and packaging). Some medium-sized Italian firms hold niche positions in “Made in Italy” sectors and, to remain competitive, are investing in innovation, making intra-firm competence ever more exclusive and unique. These firms establish relationships with specialized suppliers that integrate themselves
upstream from the supply chain, predominantly within the same local production system or, in any case, with Italian firms and rarely with foreign firms (Gagliardi, 2006). The outlet markets extend, however, beyond national borders, especially for those firms that have managed to improve their sales network, establishing relationships with medium- and high-end customers able to appreciate the product specificity and high quality.

In all the Italian regions where the presence of districts is important, one can note (Istat report 2012; 2013) improvements in export trends and Apulia recovered from -23.5% in 2009, to +17.9% in 2011 and to +7.3% in 2012, growing more consistently than the national average (+11.4% in 2011, +3.7% in 2012) and the Southern one (+10.3% in 2011 and -2.3% in 2012).

The increase in exports from Apulia in the year in question is attributable to the vehicle, machinery, metallurgical and pharmaceutical sectors, while the traditional sectors (clothing, leather and furniture) grew less than the regional average. Textiles stagnated because of the competition with countries with low labour costs. (Bank of Italy, 2012)

Despite this, Apulia, with approximately 7,000 businesses and 38,000 employees and a total added value close to 1 billion euros, equivalent to about 15% of regional manufacturing (Bank of Italy, 2008), is the southern region with the largest proportion of its economic sector derived from textiles and clothing, although, over the last decade, the sector has been the focus of profound restructuring with a number of firms in low growth since the mid-1990s until the recent economic crisis. Between 2008 and 2009, Apulian textile and clothing firms decreased in number but in spite of this, we are witnessing a process of repositioning of the businesses in the Region, through branding policies and licensing and, in 2010, the recognition of the new “Distretto Produttivo della Filiera Moda Puglia”, the “Apulian Fashion Production Chain District”, was formalized with the Regional government resolution number 1704 dated 19th July 2010. Although this legal recognition of the district is recent, its distribution both on a Regional scale and in terms of niche specialization are not and the importance of this local production has its roots in the past.

As we already know, in Italy the industrial districts received a legal recognition with the law n. 317 of 1991, which gives the Regions a prominent role in their definition and support, including funding, through the establishment of consortia. The districts identified on the basis of local systems of working are more common in central Italy, in the north-east and in the north-west with the lowest percentage in the South, as we have seen in Chapter 5. Under the law n. 266 of 2005 the characteristics of industrial districts are defined, dividing them by area and function, in order to
enhance the myriad of small and medium-sized enterprises that make up the manufacturing base of the Italian economy.

When, in accordance with the law n. 23 dated 3rd August 2007, the Apulia Region implemented a program of help for districts in order to promote growth in the size of firms, supporting their innovative activities, making them competitive and helping them to strengthen the process of internationalization, some fashion firms gave rise to a manufacturing district. Paragraph 2 of Article 2 of the regulatory directives defines “the industrial district as being characterized by: a) “a significant concentration of enterprises, particularly small- and medium-sized ones, integrated each other into a major manufacturing system” and b) “a set of qualified local and institutional actors involved in the activity of support to the local economy.”

In accordance with the law, the manufacturing districts include:

- business networks, connected by horizontal and vertical specialization, including those located in different and non-adjacent areas;
- technological manufacturing districts with a significant presence of people employed in R & D activities such as universities, research centres etc.;
- local tourist systems, as identified by art. 5 both according to the Regional Law n.135/2001 and n.1/2002,
- trans-regional and transnational manufacturing districts.

6.4 The Fashion District in Apulia

At this point it is important to consider the Fashion District in Apulia. The Apulia in fact is one of the most dynamic region in the South of Italy in term of GDP growth and the most important region where the textile and clothing sectors prevails from 2001, with a presence of six textile and clothing districts as we have explain in Chapter 5. But it is not free to the competitive disadvantage affecting the Italian economy today and the South economy in particular.

This disadvantage, as we have seen, has ancient origins, traceable back to the odd nature of Italian capitalism, characterized by a poor development of the stock exchange, the separation between banks and businesses, the broad prevalence of family ownership and the role of the State whose intervention has only partially produced the above-mentioned positive effects. The combination of these elements has led, in recent times, the SMEs to become the hub of the Italian economy, in an economic landscape that was innovative, although necessarily at a low level, as a result of the difficulty in finding venture capital. Although the Italian economy, as we have seen before, since
2000, has undergone significant changes, the fashion system in Italy continues to play a leading role, despite being the most exposed to competition. Reflection is therefore required on how to build up and support a sector that has experienced major renovation in spite of a reduction in production and a substantial rate of failure of the enterprises in question. At the same time a phenomenon of strengthening quality was also encountered for a small number of firms that, repositioning themselves in the market, have adopted policies of branding and acquisition of licenses.

Focusing on its strengths, such as quality products and expertise rooted in the territory to which one can add institutions, academics and research, Apulian fashion industry has been reorganized, forming a district to share strategies and intervention policies.

Fifteen manufacturing districts were recognized in Apulia (Aerospace, Mechanical electronics, Footwear, Furniture, Wooden Furniture, Eco-sustainable Buildings, Pleasure Craft, Fashion, Logistics, Stone working, Renewable Energy, Environment and Recycling and Information Technology) including the Fashion district.

The historical tradition, the high specialization, the continuous response to changing market conditions and the challenge of international markets have guided our choice to analyze this manufacturing district.

In the request for the manufacturing district establishment, the specialization divisions considered are those that correspond to the ISTAT classification of ATECO 2007, namely:

13-textile industries
14- garment manufacture
15- leather goods manufacture
32.1-jewelry
96.01-laundries

As can be seen from Table 10, the number of local units and employees of the sectors that are part of the Fashion District totals are, overall and respectively, of 8,106 and 51,804 in 2001.

According to the data from Confartigianato and Confindustria (Table 11), the difference in businesses in 2009 is equal to 50.41% compared to 2007 but in any case it is reduced respect to 2001 as well as the employees’ number. In fact, in 2009, the number of firms belonging to the district was of 7,444 units and the number of employees was of 32,869 in 2008.
The reduction continued in 2011 with respectively a total of 5,352 units and 28,206 employees.

Table 10 - Number of local units and employment in Apulia fashion district sectors (2001-2011)

<table>
<thead>
<tr>
<th>ATECO 2007</th>
<th>N. local units</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 - textile industries</td>
<td>1,030</td>
<td>838</td>
</tr>
<tr>
<td>14 - garment manufacture</td>
<td>4,875</td>
<td>2,730</td>
</tr>
<tr>
<td>15 - leather goods manufacture</td>
<td>696</td>
<td>496</td>
</tr>
<tr>
<td>32.1 - jewelry</td>
<td>304</td>
<td>285</td>
</tr>
<tr>
<td>96.01 - laundries</td>
<td>1,201</td>
<td>1,003</td>
</tr>
<tr>
<td>Total</td>
<td>8,106</td>
<td>5,352</td>
</tr>
</tbody>
</table>

Source: Industry and Services Census 2011, ISTAT

Table 11 – Characteristics of the Fashion district in Apulia

<table>
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<tr>
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<tbody>
<tr>
<td>No. of businesses with up to 49 employees (2008)</td>
<td>4,618 (98.76%)</td>
<td>-5.56</td>
</tr>
<tr>
<td>No. of employees (2008)</td>
<td>32,869</td>
<td>+2.11</td>
</tr>
<tr>
<td>Export 2009 (Ml Euro)</td>
<td>492</td>
<td>-31.86</td>
</tr>
</tbody>
</table>

Source: Confartigianato; Confindustria

As we have seen in Chapter 5, the Fashion district brings together 247 firms (year 2010) specializing in the manufacture of clothing for men, women, and children together with wedding ceremonial gowns which the associations, unions, bodies, universities and research centres have to be added to.

According to the Bank of Italy (2008) the added value of the fashion industry was approximately €1 billion and represented 15% of the total regional manufacturing added value and it is the first southern region in textiles and clothing, both in terms of the number of active firms (about 7,000) and the number of employees (about 38,000). The National Observatory of the Italian districts also specifies that the number of employees of the district is 3,000 (year 2010) and the district target is to support business development through the strengthening of international markets, reinforcing brands, product quality, worker and entrepreneur training together with the creation of innovative samples.
6.5 Conclusion

In this chapter we have presented, albeit briefly, an overview of the economic situation in Italy, in southern Italy and in Apulia in particular, focusing on the evolution of the industrial district with particular reference to the Apulian fashion one.

Italy, and in fact, all the countries of Euro area, is in a very delicate phase of the economic cycle with strong reduction in productivity and firm inefficiency, a decrease of employment and a reduction in investments for the consecutive 5 years. As we have marked, considering the real economy, the Italian GDP in 2012 have seen a slowdown in growth of 7% when compared with 2007, together with a reduction in the demand and in the industrial production (Bank of Italy, 2013). There has been a consequent fall in investments, a lack of ability to innovate and a loss in competitiveness and a fall in the productivity of manufacturers.

The economic fortune of southern Italy in general, and the Apulian one in particular followed the decrease in the Italian GDP, even if in Apulia economy the contraction is less than the rest of southern Italy. The decline in economic activity has impacted on the labour market. The unemployment rate doubled up to 40% for the youngest when compared with 2007, and it has exceeded this value in some areas of southern Italy. The employees’ number in 2011 is reduced of 48.4% if compared with 2001 in the garment manufacture and of 36.2% in the textile sector.

We have seen that historically, the Italian fashion industry is one of the sectors that have contributed mostly to the country economic growth. Over the years, the continuous development of the sector has allowed Italy to establish a leadership position in this field with exports driving this Italian industry until the end of the 1990s. It has since then, steadily lost ground, as a result of firm specialization in mature sectors, because of firm small size and lack of internationalization. The phenomenon of globalization, however, has had devastating effects on the competitiveness of Italian SMEs in the fashion sectors and this phenomenon has led to enforced responses from local manufacturing systems. On one hand this has provided important cost advantages for the relocation of production to emerging countries, forcing the entrepreneur into drastic but often unavoidable choices for the survival of the firms, and, on the other hand, leading to the opening up of long-standing local chains, both upstream (the suppliers of raw materials, finished goods, processing and services) and downstream (direct and indirect commercial networks). They are processes which firms, even small, must satisfy in order to compete in the new global dimension.

The results of the survey demonstrate that the performance and the strategic choices in the examined sector are different even though the firms are located in the same area. To improve their
competitiveness, it is not only necessary to foster growth in productivity that is positively related to innovation in products, processing and organization, but to develop also an ability to compete in domestic and international markets both at the firm and sectorial level. This is possible leading or participating in international supply chains.

In fact, it is through this process of aggregation and internationalization, that in Apulia, as well as in the rest of Italy, those efforts are being made to overcome the crisis.

In this changed international scenario, in this chapter, we have also reviewed the organizational industrial district literature and the transformation from hierarchical organization to polyarchical one and in the recent years the fourth stage of Italian capitalism has begun to take shape. There has been an increase in the size of some firms, even if they are not located in districts, which is followed by a change in organization, seemingly with hierarchical contours often belonging to groups and/or systems. We have emphasised that the constant call to innovations implies a commitment to investment in R&D and in human capital that the small business is unable to perform, because the excessive miniaturization of its manufacturing apparatus has eroded its ability to continue to accumulate the tacit knowledge that constituted the strength of many local units.

Analyzing the upstream part of the production chain, and in particular, the one relating to the supplier firms, it is evident that they have undergone a considerable increase in costs caused by the high degree of product differentiation.

Considering that the combinations of inputs, which allow the manufacture a range of different products, are many and varied, the suppliers are forced to change their organization (Sturgeon and Lee, 2004; Frigant and Talbot, 2005), in order to be able to offer functions and powers to their buyer businesses, including those relating to the quality and the financial management that are more connected to the range of offered services than to the strictly manufacturing functions. It should be stated that medium-sized firms, with their expertise being not only productive, but also logistical, commercial and financial, represent the link between the large final business customer and the many smaller units involved in various phases of the production process.

In this scenario, the Italian districts are business systems which are small on average, located in the same area, implementing forms of cooperation, producing and disseminating knowledge, almost forming a single manufacturing system, which, taking into account the diversity, can be compared to a large enterprise. Albeit slowly, within these systems, the medium-sized firm establishes operating in the “Made in Italy” fields. These firms establish relationships with specialized suppliers that integrate themselves first in the supply chain, predominantly within the same
industrial district or, in any case, with Italian firms and rarely with foreign firms and our case study is an example (Chapter 7). The outlet markets extend, however, beyond national borders, especially for those firms that have managed to improve their sales network, establishing relationships with medium- and high-end customers able to appreciate the products specificity and high quality.

At the last in this chapter we have highlighted as in all the Italian regions where the presence of districts is important, one can note improvements in export trends and that Apulia has recovered from -23.5% in 2009, to +17.9% in 2011, growing more consistently than the national average (+11.4%) and the South (+10.3%) although in 2012 exports decrease. Despite this, Apulia is the southern region with the largest proportion of its economic sector derived from textiles and clothing, although, over the last decade, the sector has been the focus of deep restructuring with a number of firms in low growth since the mid-1990s until the recent economic crisis. Between 2008 and 2009, Apulian textile and clothing firms decreased in number but in spite of this, we are witnessing a process of repositioning of the businesses in the Region, through branding policies and licensing and, in 2010, the recognition of the new “Distretto Produttivo della Filiera Moda Puglia”, the “Apulian Fashion Production Chain District”. Although this legal recognition of the district is recent, its distribution both on a Regional scale and in terms of niche specialization are not and the importance of this local production has its roots in the past.

The historical tradition, the high specialization, the knowledge diffusion, the Social Capabilities presence, the continuous response to changing market conditions and the challenge of international markets, have guided our choice towards the analysis of the Special clothing district composed of wedding and baby dresses as one part of the Fashion district. We analyze in the next chapter the results of the case study.
CHAPTER 7

EMPIRICAL RESULTS FOR SOUTHERN ITALIAN DISTRICTS

7.1 Introduction

In Chapter 6, we have explained the economic situation in southern Italy and Apulia region and we have described the evolution of the industrial district with particular reference to the Apulia Fashion District. The Apulia, in fact, is one of the most dynamic regions in the South of Italy and the Apulia’s fashion industry has been reorganized, forming a modern district. In this chapter, we analyze the empirical results of the case study that is composed of wedding and baby clothes of a part of the Fashion district in Apulia.

This chapter is organized as follows: section 7.2 recalls the reason why we have chosen to examine the wedding and baby clothing subdivisions in the clothing sector and the reason why we have utilized the multi-method approach for the case study. In sections 7.3 and 7.4 we focus our attention on original empirical results of a survey carried out respectively in the wedding dress sector and in the baby clothing (ceremonial clothing, hosiery and outerwear) one. In these two sections we give the general information about the business and verify the theoretical framework. More specifically we focus our attention on the district knowledge creation and diffusion and on the key role that knowledge, Social Capabilities and innovations play in the industrial districts examined. There then the conclusions follow (7.5).

7.2 The Choice of the Case Studies and of the Multi-Method Approach

As we have already noted in Chapter 5, in the South of Italy even if the weight of the districts is still marginal in comparison to the rest of the country, their presence has doubled and the regional leaders in the South are Abruzzi, Apulia and Campania, and Apulia and Campania have increased the number of districts. In Apulia there are eight industrial districts (Istat Report, 2005), including six in textile and clothing. Particularly in Apulia in 2010 the Fashion district was formalized. In 2013, the IV Report of the National Observatory of the Italian districts has also evidenced that, despite the crises began in 2008, on 22 districts localized in the South of Italy, predominates are the clothing districts that represent the 56% of the total. It means that despite the crisis, textile and clothing industries play an important role in the economy of this area.
We have also remarked that if we consider the ISTAT data 2011, the province of Bari for the textile and clothing sector with Barletta-Andria-Trani (BAT), Lecce and Taranto for the only clothing sector remain the most important in Apulia. The same data evidence that the clothing industry (division 14) is more important than the textile one (division 13).

Among these provinces we have chosen to select the southern and the northern areas of Bari the regional capital of the Apulia region because the number of local units and employments prevail. These areas are identified in the Apulia Fashion District, too.

The southern area of Bari is in fact specialized in the production of outer clothing (coats and jackets), children’s wear, bridal and ceremonial gowns. The northern area of Bari is specialized in the manufacture of hosiery, underwear, sportswear and casual clothing.

In this context and as we have remarked in Chapter 5, we have chosen to study the garment industry for the following reasons: the Italian style, fashion and historically tradition is known in the world; it is a case where there is a concentration of small and medium firms; the historically presence of a high clothing and textile districts number in the South of Italy and Apulia, the recognition of the Fashion district in Apulia in 2010, the division specialization is homogeneous, the innovative activity is important (Box 2).

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Box 2: The Italian Innovative Activity

At this point it would seem useful to present some data relating to Italian innovative activities. These are distinguished by type of innovation, by the economic activity in question and by size class (Community Innovation Survey) for the years 2002-2004 in the ATECO classification 2001 and 2006-2008 in the ATECO classification 2007. The fact that emerges is surprising, since, while in absolute terms the total number of firms declined during the periods in question and with reference to the textile industry from 1669 to 1247, for the clothing sector, the total number of firms increased from 726 to 1655. One can also point out that if, in 2002-04, only innovations in processing in textile and clothing together with product and processing for the textile industry alone were prevalent, by the years 2006-08 both product innovations and processing are greater for both sectors. The increase in the considered periods with reference to the two types of innovation was approximately 23% for textiles and 30% for clothing. The entire industry follows the same trend with an increase of 22% in products and processing. From these data it is clear that even traditional sectors are characterized by significant innovative performance, as well as the small and medium-size enterprises with 10-49 and 50-249 workers that record an increasing innovation in products and processing of 22% and 20% respectively. The phenomenon is less evident in the businesses belonging to larger size classes.

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We have chosen the wedding clothing and baby clothing sectors for our survey because it is estimated that firms, in the province of Bari, produce 65% of “Made in Italy" children’s clothing and 60-70% of wedding clothing. This sector, however, has stagnated in 2011, the year when our
empirical investigation was carried out, because of exposure to strong competition from countries with low labour costs and the effects of the economic downturn (Bank of Italy, 2012) as noted in Chapter 6.

As the ISTAT data do not go into detail of the sectors we have selected but they contain information about more aggregated data, we have had to use the Infoimprese database of Bari’s Chamber of Commerce as a source of statistical data. Of the 54 firms selected using this database, 30 from the wedding clothing sector provided valid responses to the questionnaire while in the baby clothing sector we obtained 42 valid questionnaire responses. It should be noted that the year the questionnaire was addressed, 2011, corresponded to a year in which the ‘mortality rate’ of Italian firms was very high, so it was particularly difficult to contact and obtain information from the firms themselves. The choice to search for a sound method to obtain responses to the questionnaire was very difficult at the beginning because very few firms answered the questionnaire. For this reason we chose a multi-method approach, contacting the firms by phone, by email and by appointment, the most successful technique was to approach firms during trade events.

To fully understand the importance of the fashion industry, we have compared the Industry Classification to the Academic Classification based on Pavitt’s taxonomy (1984) and Peneder’s tripartite classification (2001). Adopting the Academic Classification, in fact, the analyst catches the different production techniques for manufacturing processes required to create the final goods that differ from each other both according to the textile fibre used and by the quality, design, fashion and innovation, although the final product might appear very similar (see to this regard, Chapter 5 for more detail). The analyst catches the different sources of knowledge inputs and the different labour skills. The importance of the clothing production process and of the Social Capabilities for the industrial organization is caught. This latter is present in all the steps together with the factor intensity (labor-intensive, technological-intensive, marketing driven).

Therefore, to highlight the relationship existing among knowledge, Social Capabilities and innovation, we choose our sample from within the three categories, classical, innovative and traditional/fashion (see Table 7 in Chapter 5) at three level of disaggregation (weddings, external clothing, knit goods).

In the classic category, we include the products with wedding dresses for women and in particular suits, underwear and dresses for ceremony for man, woman and child. From the questionnaire answers, here the innovation is low, the R&D and Design are developed in house, the labour-
intensity process prevails, the workers have high and specific skills and the learning is very important.

In the innovative category we include the external clothing with the sportswear such as tracksuits, jackets and the outdoor wear for man, woman and child. From the questionnaire answers, we find that in this category the innovation is high, the R&D and Design is conducted in house and with external firms, the technology-intensity process prevails, the workers have high and generic skills.

In the traditional/fashion category, we include the knit goods (pullovers casual clothing and hosiery sweaters, jackets, T-shirts for babies and children). In this category, from the questionnaire answers, we discover that the marketing-driven is very important together with the investment in design, the process is fashion-intensive, and the medium-skill white collar prevails.

However because of the need to measure the Social Capabilities, this aspect will be discussed in detail in Chapter 8 as well as the approach used to measure the Social Capabilities.

In the next two sections we describe the original results of the surveys carried out on a sample of entrepreneurs in the field of wedding dresses (7.3) and baby clothing industrial (7.4) districts utilizing the multi-method approach because of the difficulty to obtain valid responses to the questionnaire as we have already said.

At the moment as we have remarked, we want to verify our conceptual framework through the answers to the questionnaire. We begin with the description of the characteristics of producers and with the examination of the number of relationships with employees, customers and suppliers. We study the existence of the mechanisms of knowledge diffusion and creation: social and firm networks, human resource mobility as underlined in Chapter 4 and the existences of the four modes of Nonaka and Takeuchi’s model. In fact, the existence of firm networks facilitates and favours the knowledge diffusion thought vertical and horizontal integration. The existence of social networks facilitates the knowledge diffusion through face to face relations, learning, formal and informal meeting and so on. We study the knowledge exchange and diffusion through the observation for imitation considering the participation in the trade fairs, the lecture of specialized magazines, contacts with other local, national, international firms, suppliers, commercial agents, clients, associations. We verify the sources of knowledge diffusion and creation with the presence of workers mobility, formal and informal social networks, and high productive specialization. We consider not only the district internal relations, but the external relations, too, and consequently the fluxes of knowledge inside and outside the district. The channels of knowledge transfer, which create new knowledge in fact such as we have considered in Chapter 4, are very important and they
become determinant factors of innovation (Landry et al., 2002; Barrutia and Echebarria, 2010). We focus our attention on the innovation. We verify the introduction of traditional innovation (new products, processes, organization) and the introduction of more complex innovations. This latter consists of the introduction of process experiments or product experiment (prototype numbers), CAD/CAM use, the expenditure in R&D, Design, learning and skills and the expenditure in marketing. Finally we focus our attention on the internationalization of the district firms. We verify the eventual changes in the production organization in an internationalized market, the improvement in the efficiency of the production process and in the marketing. We utilize the questionnaire also to measure the Social Capabilities in the wedding and baby clothing districts in Chapter 8. We verify how the Social Capabilities impact upon the innovation of the special industrial district composed of the two case studies in the next chapter because the complexity of this analysis. We also demonstrate how the innovative capacity, generated by knowledge and by Social Capability and interactions, induces changes in the competitive dynamics of the sector.

7.3 The Case of Wedding Dresses: Results of Survey

7.3.1 Characteristics of Producers
The empirical investigation was carried out for the province of Bari, the regional capital of the Apulia region in southern Italy (Map 5) and for the other southern and the northern areas of Bari identified in the Fashion district, through the administration of questionnaires to producers in the wedding clothing sector in 2011.
As recalled, we have chosen the wedding industrial district in the south of Italy for the following reasons: Italian style, fashion and tradition is known throughout the world, it represents a case study in which there is a concentration of small and medium-sized firms, it is the oldest of the manufacturing sectors and the division specialization is homogeneous. In addition, there was the recognition of the Apulia Fashion District Production Chain in 2010 under the terms of the Regional government resolution.

We chose this sector because it had taken over the leading position in the textile and clothing industry in the Apulia region, with the presence of c. 7,000 businesses and 38,000 active employees (National Observatory of the industrial districts, 2012) and 254 in the wedding dresses category (Infoimprese, 2011)\(^{50}\). In particular, the province of Bari, with a presence of 121 businesses (Infoimprese, 2011)\(^{51}\), and 54 that produce and/or package the clothing, producing 60-70% of the wedding dresses that are certified as being “Made in Italy”.

Of the 54 firms in the sector under examination that produce the clothing (Infoimprese, 2011)–even if this data could be distorted because it only includes those entered this database\(^{52}\) by the Chamber of Commerce-, 30 of them were interviewed. Of these 36% have their operational headquarters in the municipality of Bari and 37% in Putignano, an area specializing in the production of wedding and ceremonial dresses\(^{53}\), the remaining 27% being located in the other southern and the northern areas of the province of Bari (Map 6). The survey shows that 20% of the enterprises in question were started in the 1960s and 40% in the 1980s (Table 12) and therefore, over time, has acquired the ability and expertise to adapt to the continuous changes in order to remain competitive in the marketplace. These results demonstrate the importance of the historical tradition in this production, too. In a few cases (7%), and because of also the age of the owner, the historical circumstances limit their competitive advantage, their ability to develop and adapt the firm to the new features of the

\(^{50}\) It should be specified that in the Chamber of Commerce *Infoimprese* database, the following categories are related to the “wedding dresses” name: “packaging of other outerwear”, “retail clothing sales”, “hairdressing services”, “manicure”, pedicure and beauty treatments”, packaging of other clothing items and accessories, clothing and accessories, trade intermediaries for textile products, for clothing, furs, footwear and leather goods.

\(^{51}\) As pointed out in Chapter 4, there are no official unbundled figures from ISTAT or the Chamber of Commerce and taking into account only the number of firms in the considered sector. Hence the need to resort to unofficial sources, such as Yellow Pages and *Infoimprese* through which one can get an idea of the phenomenon in question. Other databases such as Kompass or AIDA, include only the corporations or larger-sized companies and therefore we are unable to assess these sources to get a picture of the local context.

\(^{52}\) See note 50

\(^{53}\) In the town of Putignano, although ISTAT has not identified a manufacturing district, under section 18.2 (Manufacture of other worn apparel and accessories) we find a concentration of 184 businesses in 2001 (ISTAT, 2001), declining to 155 by 2006 (Chamber of Commerce of Bari) although more disaggregated official data are unavailable. According to the *Infocamere* data there are 26 activities of which 20 operate in the manufacture and / or repackaging of wedding dresses.
marketplace, the adoption of new technologies, such as the use of computers and related software. They are mostly individual businesses and, to a lesser extent, a joint-stock company. Considering the prevalence of individual businesses we understand immediately the finding of micro and small enterprises.

Map 6 – Company Headquarters of the businesses in the wedding sample (%)

Table 12 – Activities started in wedding dress sector

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1959</td>
<td>6.6</td>
</tr>
<tr>
<td>During the Sixties</td>
<td>20.0</td>
</tr>
<tr>
<td>During the Seventies</td>
<td>3.4</td>
</tr>
<tr>
<td>During the Eighties</td>
<td>40.0</td>
</tr>
<tr>
<td>During the Nineties</td>
<td>16.7</td>
</tr>
<tr>
<td>After 2000</td>
<td>13.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: our investigation elaboration

It should be reminded that in Italy there is a considerable debate about the classification of firms depending on the considered country⁵⁴, about the sector being analysed and especially about the definition of a medium-sized firm⁵⁵.

⁵⁴ (See Ancona et al., 2008). The international comparison among Italy and other similar countries for income and industrialization leads to the observation that Italian business is of a different type. As a consequence what is considered large in Italy it is considered small in other countries and what is considered a large company abroad it is enormous in Italy.
An examination of the size class (Figs. 11 and 12) in this sector shows that 40% of the firms have no permanent but only seasonal employees, called during busy periods and/or for delivery or to create the samples, 30% are micro-enterprises with an average number of 5.1 employees, 20% are small enterprises with an average of 12.5 employees and only 10% have an average of 30.6 permanent employees and therefore we classify them as medium-sized enterprises. The average number of full-time employees in R&D and Design is equal to about 2.3. Analysis of the questionnaires also revealed that the number of employees has been reduced considerably over the period 2001-2011, dropping, at least in the district in question, from an average of 35.6 to 7.1. Casual and irregular workers are not included in these values. It is important to note that the questionnaire was administered in the month of November, a period in which the new collections are presented and the period with the highest concentration of deliveries of clothing that occurs during the spring and summer. It is possible, therefore, that the data about the number of employees represent an underestimate.

According to the ISTAT Report (2012), Italian industrial structure is characterized by the strong presence of micro enterprises (Table 13), enterprises with less than 10 employees. These microenterprises are over 4.2 million, representing 95% of the total enterprises and occupy 47% of employees. 20% of workers (about 3.5 million) work in small firms (10 to 49 employees) and 12.4% (over 2.1 million) in the medium-sized ones (50 to 249 employees). Only 3,707 enterprises (0.08%) employ 250 or more employees, absorbing, however, 21% of total employment (about 3.5 million people). The variable “employees” alone has several definitions of threshold values so it is often necessary to add the annual turnover class. Based on the recommendation of the 2003 European Commission n. 6, implemented at national level by the Ministerial Decree of 18 April 2005, the dimensional parameters of enterprises should be determined by considering their total budget or their turnover and number of employees.

Table 13 – Enterprise size classification for EUROSTAT and ISTAT

<table>
<thead>
<tr>
<th>Size Classification</th>
<th>Employees</th>
<th>Turnover (millions of Euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro enterprises</td>
<td>1-9</td>
<td>Up to 2</td>
</tr>
<tr>
<td>Small enterprises</td>
<td>10-49</td>
<td>More than 2 and up to 10</td>
</tr>
<tr>
<td>Medium-size enterprises</td>
<td>50-249</td>
<td>More than 10 and up to 50</td>
</tr>
<tr>
<td>Large-enterprises</td>
<td>More than 250</td>
<td>More than 50</td>
</tr>
</tbody>
</table>

Source: Eurostat and ISTAT

Considering that, as we have seen, the Italian industrial system is characterized by a large number of micro and small enterprises that absorb the majority of the total number of employees, we have considered appropriate to add (Table 14) the traditional division 10-19 class which is more relevant to the sector concerned and the reality of southern Italy.

Table 14 – Size Classification in wedding dresses

<table>
<thead>
<tr>
<th>Size Classification</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro-enterprises</td>
<td>1-9</td>
</tr>
<tr>
<td>Small-enterprises</td>
<td>10-19</td>
</tr>
<tr>
<td>Medium - small enterprises</td>
<td>20-49</td>
</tr>
<tr>
<td>Medium-large enterprises</td>
<td>50-249</td>
</tr>
<tr>
<td>Large-enterprises</td>
<td>&gt; 250</td>
</tr>
</tbody>
</table>
Due to the lower number of first marriages in Italy – dropping from 392,000 in 1972 to 197,000 in 2009 (ISTAT, 2010) – as well as the current economic crisis, during our survey, in 2011, we may explain the contraction in employment levels for the district as a whole in which, when staff reach pensionable age, they are not replaced. In addition, the structural problems of the Italian industry, begun around 2000 that prevents the growth of the economy, can be attributed to the model of productive specialization characterized by small firms operating at the level of family capitalism.\footnote{It should be noted that on the European scene the Italian economy is not the only one that shows these features. Suffice it to say that if, within Italy, among firms listed on the stock exchange, about 60% have 70% of their capital in}
to which one can add the adoption of new technologies which improve worker productivity, and this may explain the contraction in employment levels for the district.

In a different perspective, the presence of micro and small firms creates a house atmosphere, where the face to face interactions are prevalent. This face to face interaction facilities Nonaka and Takeuchi’s socialization and the exchange of individual tacit knowledge. In fact as we have noted in Chapter 2, the greater the relations among actors the more the actors develop a common language and ideas and the easier it is to transfer knowledge. In a micro and small firm appreciating and valorizing the worker’s ability and skill for the direct contact between worker and owner is also possible. This firm size accompanied by the social network favors not only the knowledge creation but also the internal knowledge diffusion.

The crisis in the sector seems less tied to consumer choice, faithful to the niche and willing to make sacrifices - by borrowing or spending their savings - to devote a significant part of the family budget, spending 2,000 - 3,000 euro on the purchase of the wedding dress alone. The expenditure for the purchase of the groom’s clothes, however, is more modest and variable.

The number of customers (Fig. 13) is more than 50 for 77% of firms, and among these, some are working for 180-200 annually even while 3% have a numerically lower, but selected number of customers (1-3 or 4-10). The fact that the customers’ number is more than 50 for 77% of the firms is very important because it implies a great number of social and firm relations. These relations can be internal and external to the district. The customer data derived from the responses to the questionnaires may, in fact and in our opinion, also include firms that order the full package of clothes onto which they then put their own label with an exclusivity clause. In this case, some of the microenterprises produce both independently and for third parties. They can be important channels of knowledge transfer inside and outside the district as well as the relationships with customers because the innovation product is inducted from the demand too.

The firms that make up the sample under investigation have between 11 and 50 suppliers (Fig. 14). We are therefore dealing with small and very small companies that, however, are very dynamic as they interact with a wide range of local and national customers and suppliers located in Milan to provide them with embroidery, lace and in Como for silks and fabrics. They also have foreign suppliers for French lace and for particular fabrics or quality lace.
This means that when the relations with external suppliers are cooperative, they are a source of knowledge transfer and combination. In other words, this process implies for the district firms, different combination of knowledge: external codified knowledge with internal tacit knowledge, tacit knowledge with internal tacit knowledge and codified knowledge with internal codified knowledge. The NTM, instead, considers only the transfer of explicit knowledge to explicit knowledge.

In about 30% of firms surveyed the distribution of the finished product is done through wholesalers, or directly to retailers, both Italian and foreign, while some firms do not have their own points of sale. The firms do not relocate their production activities abroad in order to maintain the high
quality of the product, but they limit to the marketing, approximately 17% of which is achieved through the signing of contracts with agents, importers and distributors. In a few cases (about 3.3%) agreements are signed with third parties.

7.3.2. The Role of Knowledge, Social Capabilities and Innovation

The carried out analysis shows that local firms, often small or very small in size, do not cooperate with each other, limiting themselves to exchanges of knowledge and information on suppliers or distributors to reduce transport costs, while no innovative knowledge or market information is exchanged.

The intensity of cooperative relationships with suppliers, both local and national, is very important including those in Milan for embroidery and lace and those in Como for silk and fabrics as well as the international ones, especially laces in France. With the suppliers they exchange knowledge with regard to new materials and fashion trends. Relations with the majority of external buyers are established at industry events reserved for professionals working in the sector. Participation in local events reaches 80%, with slightly less than 7% also participating in trade fairs and fashion shows that take place both in Europe, in the United States and in Latin America.

Unlike at a national level where firms, as shown in Figure 15, implement innovation both for the product and the processing, 90% of the surveyed firms pay particular attention only to product innovation that in small firms is carried out through the presence of an average of 2.3 employees for research and design, a number that rises to an average of 3 units in micro-enterprises. This result can probably be accounted because of the presence of seasonal working, temporary employment and irregular employment. On the other hand, as already said by Marshal in 1890, in a district the workers do not belong to businesses, but to the district. In the district, in fact, the labour market is flexible and workers, who move from one enterprise to another within the district, are more tied to the district than to the business in question. Consequently the labour market within the district is highly flexible.

Therefore if the human resource mobility is a source of tacit knowledge diffusion among firms and it is a source of new knowledge and innovation, the no cooperation actions among the district firms induce the rival firms to observe the artefacts so to imitate them, improve them and reach a higher competitive advantage. In this way the knowledge is caught inside the artefacts. The artefact, in fact as we have seen in Chapter 4, includes in itself tacit and codified knowledge as well as the
behaviour of an innovative enterprise. But at the same time this implies that the innovation is incremental and no radical such as the results of survey confirm.

**Figure 15** – Levels of innovative activity in enterprises in wedding dress sector

![Bar chart showing levels of innovative activity](chart.png)

Source: our investigation elaboration

The innovation activity is carried out in-house in 87% of cases and only about 7% in collaboration with other firms. This finding is particularly interesting, as it shows that the firms in the sector are vertically integrated because the firms control the whole value chain and rely little on specialised R&D firms, in contrast to what happens for suppliers, in which collaboration is high and where their orientation tends towards the purchase of intermediate goods and factors of production. Product innovation is closely linked to the used fabric and to new materials in the groom’s suit with 100% of consumers who prefer a classical style and not a tailored suit as, for example, in the case of the bride dress which needs a study of the structure of the bodice. In most cases (80%), innovative activity is induced by the requests or preferences of the bride-to-be. The choice of wedding dress is for a casual dress only in 18% of cases, for a modern one in 36% and predominantly, equivalent to 46%, for a classic look, almost always enriched with a detail that makes it unique and different for the wearer (Figs. 16, 17 and 18).
Figure 16 - Choice of the wedding dresses

Source: our investigation elaboration

Figure 17: Example of wedding traditional, modern and casual dresses
The innovation process (Fig. 15), carried out by 33.3% of firms because of the competition, culminates in the purchase of new machinery and the use of CAD (Computer Aided Design) or CAM (Computer Aided Manufacturing), in order to improve production efficiency. 56.7% of firms do not carry out process innovation, preferring to use traditional methods, such as, for example, the design of the handmade dress while 10% of firms did not provide a response. 40% of surveyed firms are also careful to innovate with regard to their organization and marketing through websites that for 73% of firms makes market access easier, facilitating contact with consumers.

With CAD/CAM use and with the design of the handmade dress, Nonaka and Takeuchi’s externalization (transformation of knowledge from tacit to explicit) is high such as the figurative language and the imagination.

Considering the importance of the typology of relationship (formal or informal) among firms and consequently the exchange of knowledge (codified or tacit) among firms (Fig. 19), we can remark that among those that are direct competitors producing goods which are close substitutes but which are differentiated in terms of quality and design in order to meet the needs of consumers, the knowledge exchange is absent. This typology of relations among firms is confirmed at local, national and international level. Whenever this exchange of knowledge takes place it is formal in
20% of cases or mainly informal because it is obviously based on relationships of trust. As we have stressed in Chapter 2, the trust is a source of creation and diffusion of knowledge in a network. The knowledge is transmitted only within the same firm, while with their competitors the exchange of information on upstream or downstream phases of the process is limited. It is worth noting that in most of the micro-enterprises which make up the district, the meetings (social networks) between the workers and owners, including stylists and designers, are, as a whole, very informal. In this case they are a source of knowledge creation and diffusion. With only the larger firms they organize formal meetings with designers and stylists from outside the firm, usually to define a collection of clothes (Fig. 20).

**Figure 19** – The importance and the typology of knowledge/information exchange among surveyed firms and local, national and/or international firms in wedding dresses. (1.Not important; 5. Very important)

![Bar chart showing the importance of knowledge exchange](image)

Source: our investigation elaboration

**Figure 20** – The number of formal and informal meetings in a month in wedding dress sector (average)

![Bar chart showing the number of meetings](image)

Source: our investigation elaboration
As we have noted before, one can identify a transmission of knowledge in dealing with suppliers (Fig. 21), especially those that are non-local where the relationship is one of a cooperative activity with the contracted suppliers. This knowledge diffusion is confirmed at local, national and international level.

**Figure 21** – The importance of knowledge exchange among surveyed firms and local, national and/or international suppliers in wedding dress sector (1. Not important; 5. Very important)

The contracted suppliers, in fact, producing complementary goods (shoes, accessories, jewellery, flowers, and confetti) or offering services, including those of a wedding planner, increase the demand for the product. Great importance is given (in 93% of cases) to information relating to innovative knowledge and the market, obtained mostly from customers (70%) and suppliers (66.7%), both internal and external to the district. Knowledge is also acquired by consulting specialist journals (43.3%) and in some cases through access to the internet to study the techniques used directly through tutorials (atelier videos). Similarly relevant for 40% of firms are commercial relations with agents, both Italian and foreign and the participation to the trade fairs (Tab. 15).

Taking into consideration the importance of institutions in the process of knowledge sharing, the firms aspire to create synergy with institutions, which, however, “ignore” them, as well as with associations and consortia, which are not particularly present, seeking to fill these gaps by participating in trade fairs and industry events at a level that is compatible with the costs that this sort of exposure implies.
Taking into account the importance of human capital, of learning and of the accumulation of knowledge discussed in Chapter 2, attention is also paid to the process of training existing staff (expenditure on skills) and for new employees (expenditure in learning) which for 10% of respondents translates into a cost of between 5,000 and 10,000 Euros and for 20% in skills costing up to 5,000 Euros. Considering the period in which the interview was carried out, 2011, the year of economic recession, we believe that this represents a good result, as firms have a small budget for training.

The survey shows that, despite the great attention paid to the two types of expenditures, the spending on R&D and Design, in 2011, for 20% of the firms, does not exceed 5,000 euros (Table 16), reaching more than 20,000 euros for 14% of firms and in only a few cases, especially ltd. companies, because of their bigger size, face a higher expense from 50,000 to 90,000 euros. In this case as well it is necessary to consider the low budget that firms have available in the light of the economic recession that has struck them. At the same time a growth in knowledge is increased by technological change that can be happened with the investment in R&D.

We do not know whether skills training are related to upgrading existing workers in CAD/CAM skills or whether it is a training process to teach new recruits and apprentices. The low expenditure in training and innovation are a structural problem in an industry made up of small firms, where innovation is to be meant not only as an investment in research and development and in the adoption of new technologies, but also as the gradual evolution of product types, adapting to constant changes in consumer tastes, implementing new organizational methods, both internally and in their relationship with other firms, customers and suppliers (Cappellin, 2010) as well as creating
new types of contract, new means of distribution, marketing slogans, new individual ways of working (Tether et al., 2005), and marketing and design innovation. On the other hand the issue of training leads neatly to the characterisation of an industrial district, inasmuch as the tacit knowledge is transmitted through ‘learning by doing’. Nonaka and Takeuchi’s internalization associated with ‘learning by doing’ or internalizing experiences into tacit knowledge held by individuals is in fact very important in this district for the presence of specialized works and for the workers’ mobility.

The firms, nevertheless, in the sample underestimate the importance of investments in human capital, in training and the development of both general skills and specific skills as being important in determining productivity and growth according to the theoretical framework (presented in Chapter 3). A lot of firms require specific skills which cannot be provided by general-purpose education and new technologies and organizations require continuous learning, best accomplished by workplace training (Becker, 1964)

**Table 16 - Expenditure in innovation and training firms in wedding dress sector in euros (2011)**

<table>
<thead>
<tr>
<th>Budget</th>
<th>Expenditure for innovation and training</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expenditure on R&amp;S and Design (%)</td>
<td>Expenditure on Learning (%)</td>
</tr>
<tr>
<td>Up to 5,000</td>
<td>20.0</td>
<td>7.0</td>
</tr>
<tr>
<td>From 5,000 to 10,000</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>From 10,000 to 20,000</td>
<td>3.3</td>
<td>4.0</td>
</tr>
<tr>
<td>More than 20,000</td>
<td>14.0</td>
<td>0.0</td>
</tr>
<tr>
<td>N/A</td>
<td>63.0</td>
<td>79.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: our investigation elaboration

At the same time as we have highlighted in Chapter 4, CAD/CAM use and the prototypes involve people interacting and combining knowledge. In 57% of cases (Fig.22) the prototypes are processed and manufactured using CAD or CAM, and in other cases are drawn by hand. The firms also carry out experiments with regard to other processes in 27% of cases and to the product in 77%.
The lively innovative performance, met in this traditional sector, reflects the importance that is attributed to the exchange of knowledge, seen from the manufacturer’s side one.

7.3.3 The Knowledge Sharing in the Modern Wedding Industrial District

An analysis of the results of this case study does not seem to have the characteristics of the cases identified in the literature, but it is a hybrid district or, better, using the Markusen classification it has some peculiarities of the traditional Marshallian district, but the industrial atmosphere of Marshallian memory is absent.

Like the “Marshallian”, the wedding clothing district has low-level economies of scale and key investment decisions are made locally. The raw materials, originated from outside, are processed within the district. The final product is sold both inside and outside the district and like the “Marshallian” industrial district, it is special in terms of the nature, quality and flexibility of the local job market with workers moving between firms within the district and being more strongly tied to the district than to a particular enterprise that may employ them. Quoting Granovetter (1973, 1985), another force in the wedding is produced by the extensive diffusion of weak ties due to the great mobility of highly skilled workers within the district. The workers, including seamstresses, are most often taken on part-time and during periods involving the delivery of clothes and as a result they are not part of the firm, but they are part of the district. Because of the strength of the weak ties, the Social Capabilities in the wedding clothing district are very high as we verify in Chapter 8.
Unlike the typical Marshallian district, empirical analysis shows that the wedding district is characterized by a territorial proximity (Boschma and ter Wal, 2007) and not by an agglomeration (Becattini, 1979, 1989; Brusco, 1989) of micro and small-sized firms. These firms, as we have seen considering the results, do not cooperate with each other, limiting themselves to exchange information about internal and external suppliers or distributors to reduce transport costs, while no innovative knowledge or market information is exchanged. In other words, the district is a place where a firm individual knowledge is not transformed easy into district knowledge through firm networks, even though the district is characterized by common values, rules and language. The mechanism of firm networks drives the diffusion of knowledge, instead, through the exchange of information with the suppliers. The firms have not a direct relationship, but indirect relationship because they have in common a third agent, the supplier, through which knowledge is transmitted and diffused in the districts. The internal and external suppliers together with the workers’ mobility are a very important mechanism for the diffusion of knowledge, for the combination and for the creation of a new knowledge and innovation (Figure 23).

In this way the firm individual knowledge is transformed indirectly into district knowledge. In fact the district is characterized by common values, rules and language.

Figure 23 – The knowledge diffusion in the modern wedding industrial district

However, there are pioneer firms characterized by a specific innovation capability and dynamism that have diversified their production, know-how and part of the value chain, achieving economies of scope. These firms, in fact, due to the diversification of the asset, producing men, women and children’s ceremonial wear, sometimes extending their production to casual and/or classic babywear. In this way they are able to build relationships and enjoy the positive spillovers of both districts, constituting a point of union between the wedding district and the baby districts.

The wedding district is also a modern district because it is characterized by frequent vertical interactions with internal and external suppliers-buyers and internal and external customers, by few horizontal interactions with the firm direct competitors, by horizontal and cooperative interactions
with firms that produce complementary goods (shoes, jewelry, accessories) and subcontractors, and few interactions with institutions and other bodies. The interactions with associations such as consortia are important, but the interactions with institutions do not have the same importance. Therefore vertical and horizontal interactions are very important. In particular the firms establish frequent and cooperative relationships with internal and external suppliers, with whom the ties are strengthened, together with the deeply-rooted relationships with their supply network and contract workers, both very numerous in this district.

7.4 The Case of Baby Clothes: Results of Survey

7.4.1 Characteristics of Producers

The empirical investigation was carried out within the province of Bari, the southern and northern areas of Bari and the municipality of Martina Franca (Taranto) in the Apulia region, through the administration of questionnaires to producers in the baby clothing sector and considering sportswear, outerwear, ceremonial clothing and pullovers. The questionnaire was given to businesses using e-mail, through direct contacts preceded by telephone appointments or administered during a specific sector event, Pitti Immagine Bimbo (Florence, January 2012). It is the most important international fair organized in Italy, reserved for buyers in the sector and considered a platform to showcase new trends in baby “lifestyle”. We chose this sector because it had taken over the leading position in the textile and clothing industry in the Apulia region, with the presence of about 7,000 businesses and 38,000 active employees (National Observatory of the Italian Districts, 2012) and 169 in the baby clothing category (Infoimprese, 2011)\(^\text{57}\). In particular, the province of Bari and the municipality of Martina Franca (Taranto) have a presence, respectively, of 85 and 18 firms (38 in Taranto) (Infoimprese, 2012)\(^\text{58}\), producing and/or repackaging their own clothes and for third parties. Of the 103 firms in the sector under examination - although this may be biased since it considers only the firms recorded in the database\(^\text{59}\) maintained by the Chamber of Commerce - 42 responded to the questionnaire in a valid way.

\(^\text{57}\) It should be specified that in the Infoimprese database of the Chamber of Commerce, the search item is “capi di abbigliamento bambino (child’s clothes)”. This search lists the firms that produce or repackage teenagers and children’s clothes on their own account and for third parties. The search “abbigliamento bambino (child’s clothes)” however, also relates to the following activities: wholesale fabrics, bedding, curtains, rugs, blankets, underwear for men, women and children, fur, leather, lingerie, footwear, sportswear.

\(^\text{58}\) See note 50

\(^\text{59}\) See note 50
The results of the survey are based on a sample of 42 firms that package and sell children's formal wear, pullovers (hosiery), sportswear and outerwear (coats and jackets) for the 0-14 age range. Almost all surveyed firms have headquarters (Map 7) in the Province of Bari (90%) of which 38.1% are in Putignano (Bari), an area specializing in the production of wedding dresses and ceremonial clothing and 9.5% in Martina Franca (Province of Taranto). In fact, if we consider the share of workers just in worn apparel, dressing and dyeing of fur out of the total in employment (see Appendix Table 1C) and the resident population (Table 2C in Appendix) it can be seen that in 2001, these values, which, respectively, were equal to 2.89% in Bari, 2.45% in Apulia as a whole, and 16.72% in Putignano, amounting to 4.34% in Bari, 0.71% in Apulia and 4.45% in Putignano, are high compared with those of the rest of Italy. These numbers also reflect the very important role of this sector and of this production centre.

Map 7 – Company Headquarters of the businesses in the baby clothes sample (%)
initial results confirm the Schumpeterian thesis according to which larger firms invest more in innovation, design, fashion, precisely because they are able to maintain their competitive advantages over the long term. But, as we have highlighted in Chapter 2, SMEs operating in the traditional sectors such as clothing, introduce typologies of innovation, defined as “Schumpeter Mark I”, characterized by low entry barriers, by firm entry higher rates, and innovations are generated and developed by new firms with new ideas, new products and new processes. The low appropriability and the low cumulativeness that characterize “Schumpeter Mark I” give the possibility to diffuse innovation through the district.

The main legal form of the businesses in question is that of the limited liability firm (78.6%).

Table 17 – Year of firm start-up in the baby clothes

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1960</td>
<td>9.5</td>
</tr>
<tr>
<td>1960 - 1969</td>
<td>2.4</td>
</tr>
<tr>
<td>1970 - 1979</td>
<td>7.1</td>
</tr>
<tr>
<td>1980 - 1989</td>
<td>23.8</td>
</tr>
<tr>
<td>1990 - 1999</td>
<td>23.8</td>
</tr>
<tr>
<td>Post-2000</td>
<td>19.1</td>
</tr>
<tr>
<td>Data not available</td>
<td>14.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: our analysis of the survey data

An examination of the size class (Figs. 24 and 25) shows that, considering the sector, 42% of the firms are small-to-medium scale enterprises with an average number of 28.8 employees, 24% are medium-to-large scale firms with an average number of 86 employees and 22% are small-scale businesses with an average number of 11.44 employees. Only 12% of the firms are micro-enterprises with an average number of 5.8 employees. An analysis of the questionnaires also reveals that the number of employees was reduced considerably over the period 2001-2011, particularly following the crisis of 2008 and the process of restructuring of the sector (see Chapter 6 for more details about the economy situation).

Taking into account the importance of the expenditure in R&D because it contributes to firm innovation and competitive advantage, the average number of full-time employees in R&D and Design equal to about 16.4, considering the size class of reference is significant. In this case a direct connection exists between the number of employees in R&D and Design and enterprise size that has grown more over time. This is most probably, and as Demsetz said (1974), a result of the

60 In this research it is not possible to differ R&D expenditure from Design expenditure because the time to answer to a questionnaire is limited.
success and profits achieved, the firms have continued to innovate. But this connection cannot be analysed out of context, that is, without taking into account the concentration of enterprises in a considered industrial area (Pavitt, 1984).

**Figure 24**- Number of employees according to firm size in the baby clothes

![Number of employees according to firm size in the baby clothes](image1)

Source: our analysis of the survey data

**Figure 25** – Number of employees and workers in R&D and Design according to firm size in the baby clothes

![Number of employees and workers in R&D and Design according to firm size](image2)

Source: our analysis of the survey data

The number of customers (Fig. 26) is more than 50 for 90% of firms, and among these, some, the largest, have a thousand clients in Italy and abroad. This means that the number of social networks is very high at local, national and international level as well as the knowledge diffusion. Only 10% of the firms have less than 50 customers but these are contract manufacturing firms which therefore select their clients. In any case, as many as 22% of the sample firms produce under their own label and are contract manufacturers. Others are contract manufacturers working as tailors; others still produce their own brands, owning licenses. As we have highlighted in the theoretical part, these different contract typologies are important channels of knowledge transfer inside and outside the
district as well as the relationships with customers because the innovation product is inducted from the demand, too.

Another important channel to knowledge exchange is represented by the relations with local, national and international suppliers. In this case, 50% of the firms making up the sample have between 11 and 50 suppliers (Fig. 27). In this case, the firms are very dynamic as they relate to a wide range of local and national customers and suppliers located in Northern Italy in order to provide fabrics and, in particular, the polyester suppliers are located in Veneto, Lombardy and Tuscany, the cotton suppliers in Prato and the lining and wool suppliers in Biella. There are also foreign suppliers such as those in China and Turkey that provide with accessories and semi-finished products.

**Figure 26** - Number of customers per businesses in the baby clothes

Source: our analysis of the survey data

**Figure 27** – Number of suppliers in the baby clothes

Source: our analysis of the survey data

Some interviewed firms (7%) have chosen to have different showrooms throughout Italy. With this strategic choice the Italian customers have directly the possibility to know, to display the products and contextually to touch and to try them.
Other firms have decided to choose the national and the international market penetration and distribution. The attention paid to national and international market penetration is very important for the analysed firms. 52% of the firms distribute their product by relying on sales agents and distributors, operating both in Italy and abroad. With this strategic choice the buyers have the possibility to know and to display the products. The internationalization, however, is not purely commercial in nature, thus affecting only the sales and distribution chain, considered that some firms have relocated the production process abroad (Albania, Thailand, China and Turkey), or have entered the sub-contracts and licenses (4.7%).

The internationalization strategy, most prevalent in this sector, has an important consequence on the organizational level (Caroli, 2013, p.133). In fact it raises the problem of finding a structure capable of managing the distribution of the product and the geographical diversification of activities. The firm must not only be able to activate mechanisms of control and coordination abroad, but the firm must maintain a uniformity of work. At the same time the firm must be able to learn from the different geographical contexts where it operates, to develop appropriate responses to stimuli coming from the internationalization process. This process also influences the type of knowledge that it is able to acquire and the way how this knowledge is absorbed and it becomes part of the business system.

In fact, the internationalization includes not only licenses and delocalization of production process but also subcontracting agreements as consumers are often not willing to buy clothes that are too expensive. The baby garment, in fact, has a rather short life due to the rapid growth of the child, in contrast to this it is the case of wedding clothing, for a specific event customers are willing to spend rather a lot. By internationalizing some phases of the production process with higher labour intensity, firms are able to reduce production costs and satisfy the consumer. But the strategy of producing abroad was driven not only to reduce costs, but it is driven by the need to move production closer to the consumption market, avoiding the currency exchange risk, and to use cheaper local raw materials (Crestanello and Tattara, 2011, p.243). It is the case of China and Turkey that are suppliers and at the same time in these Countries subcontracting agreements are entered. The steps that create higher added value such as the creation of the dress, fashion, design and innovation together with those below, such as product quality control, packing, distribution and sale are, however, controlled directly by the parent firm in Italy. In this sector, since competition is very high, an important source of differentiation is the geographical location as consumers, preferring nearby and easily reached stores, take the sale price of the goods and transport costs for their purchase into account. At the same time, as we have described, the customers have directly the possibility to know, to display the products and contextually to touch and to try them. This explains
why the firms in the sector in question make use of many commercial agents in Italy, Spain, Russia, USA and the UK and have outlets throughout Italy and abroad.

The production is organized according to two supply chains. The first one uses Italian and European suppliers to produce more complex product of high quality, while the second one uses Asian suppliers for more standardized production. All of this depends on the degree of customer loyalty, the vertical differentiation linked above all to the good quality of the goods certified as “Made in Italy” and produced using environmentally-friendly materials and dyes that are certified and non-allergenic. In fact, the Eco Safe brand is increasingly popular.

The spread of online sales or the viewing of the catalogue online, which is widespread among the firms in our sample, makes them more competitive, because they get closer to the consumer, eliminating the geographical distance. Online sales in the baby clothing sector is in fact very popular, unlike in the case of wedding dresses because of their higher sale price and because they need to be tried on and eventually altered before the purchase. In spite of everything, as shown previously, the wedding dress websites are also very accurate and detailed, showing the collections, so that the consumer can make an initial selection according to their tastes and preferences.

7.4.2. The Role of Knowledge, Social Capabilities and Innovation

As we pointed out in the previous sub-section, the R&D and design represent a particularly significant aspect in this sector, that, for 90% of cases are conducted in-house with the firm relying on a research team, which, in 10% of cases, includes cooperation with external firms. Firms in the sample tries to strengthen their presence in domestic and international markets through the creation of innovative samples, investing in quality products - many firms are certified as 100% “Made in Italy” - conducting careful marketing policies, for which they spend an average of €54,000 a year and more than €100,000 euros for 9.5% of the firms in the sample. The websites, deemed very important by 66% of the firms, make market access easier, facilitating contact with consumers to which, as noted above, the online sales can be added.

The great attention paid to innovation is borne by the investments on R&D and Design, the survey showing (Fig. 28) that 26% of the firms spent more than €100,000 in 2011, 12% of the firms from €50,000 to €99,000, 26% of the firms €10.000 to €50.000 and only 17% of the firms up to €10,000. It is important to highlight that the high investments on R&D and design is carried out not only by the largest-sized firms, but also by smaller sized firms, although the figures are more modest. This is a very important result because the firms in the sample, despite the economic downturn, continue to invest although rather less than in previous years. Considering the importance of the expenditure
in R&D and remembering our academic classification developed in Chapter 5, we divide the baby clothing activity into 4 groups in the next chapter because we have to measure before the Social Capabilities.

In this sector, however, firms spend little in Learning and Skills. Indeed, it is worth pointing out that in the sector of baby clothing, the expenditure is zero, while those in the wedding sector were very small. This means that the work of tailoring and, therefore training, is more specific and relevant to the preparation of a wedding dress and that the internalization associated with “learning by doing” is not very important in the baby sector.

It also means, and according to the literature presented in Chapter 2, that, in the baby clothing case, the firm networks are more important because knowledge is transferred among partners that are part of the inter-firm cooperative arrangement and through the collaboration in R&D and Design.

**Figure 28**- Expenditure in R&D and Design in the baby clothes in 2011 (Euros)

![Expenditure chart](image)

Source: our analysis of the survey data

Taking into consideration the importance of continuous innovation because the restructuring process and the market volatility, 100% of the surveyed firms pay particular attention to product innovation (Fig. 29) and in most cases (90.5%) innovative activity is a result of the demand.
In fact, the research channels and creation of baby and children’s fashion, although originating from those of women’s fashion, (given that, in most cases, it is a woman purchasing for the child and therefore her choice that prevails), require and produce, however, with different colours, cuts and materials that have to take into account the needs, the psychology and the preferences of the child, that varies according to the age. They differ, therefore, in their specific lines, sense of style, colours and age range (Figure 30).

**Figure 29 – Levels of innovative activity in enterprises in the baby clothes**

**Figure 30 - Example of baby clothes**
It should also be noted that many firms, with famous brands for men and women in Northern Italy, have broadened and diversified production, exploiting the economies of scope, putting a line of children’s clothing next to those for men and women and they gave the licensing of their brand to the children clothes firms that are included in the sample, relying on their experience. They have adopted business strategies with the recourse to “Buy” rather than to “Make”. These (the firm of our sample), therefore, in addition to produce their own brand/s, have production licenses. It follows that the intensity of formal and informal relationships and the share of knowledge with businesses outside the industrial district is very important and relevant. The carried out analysis shows that the sample firms have woven important relational ties with other local businesses, both formal and informal ones. These are part of the industrial district approved in 2010 - one is the leading company - and the number of businesses with which some firms in the district may interact has reached, for some of them, as many as 50 or even 150 businesses. In addition to being their own producers, they are also the contract manufacturers in the district and 31% of the respondents are
members of the Consortium Baby Italy, founded in 1999 with its headquarters in Putignano. In particular, the Consortium plays the role of assisting the member firms in organizing major shows and organizes national and international events in foreign countries, including Japan, Russia and China.

According to the literature presented in Chapter 2 (Amin and Cohender, 2004; Boshma and ter Wal, 2007) in the baby clothing district, the geographical proximity only is very important, but it is not sufficient to generate knowledge and learning. The role of social, economic, cultural and institutional proximity is also important as the geographical dispersion considering the important international relationships.

The exchange of knowledge among firms (Fig. 31) that are direct competitors producing goods that are close substitutes but differentiated in terms of quality and design in order to meet the needs of consumers is important. The firms in the industrial district, in fact, relate and exchange knowledge within the consortium of which they are members as well as during shows. Many firms, as we have noted, not only produce their own goods, but they are also contract manufacturers for other firms in the district, with which they relate continuously and informally, in a similar way to that which takes place with local, regional and national businesses. With firms with which they enter into licensing agreements, however, important relations of a formal nature prevail, but the exchange of knowledge is equally important.

**Figure 31** – The importance and the typology (formal or informal) of knowledge/information exchange among surveyed firms and local, national and/or international firms in the baby clothes. (1. Not important; 5. Very important)

Source: our investigation elaboration
In most of the enterprises that make up the district, meetings among the workers and owners, manager and workers, and among managers, are, as a whole, very informal, the larger firms organizing formal and informal meetings with designers and stylists from outside the firm, usually to define a collection of clothes (Fig. 32). It means that the socialization and the combination of the NTM are very high for the numerous social networks and informal meetings.

**Figure 32** – The number of formal and informal meetings in a month in the baby clothes (average)

One can also identify a transmission of knowledge in dealing with suppliers (Fig. 33), especially those that are local and regional.

**Figure 33** – The importance and the typology of relationships (formal/informal) to exchange information/knowledge among surveyed firms and local, national and/or international suppliers in the baby clothes. (1. Not important; 5. Very important)
The suppliers as well, both local firms in the sample and national ones, maintain important relationships and exchange knowledge on new materials and fashion trends. However, these relationships are distinguished by being more formal with foreign suppliers, with those outside the district and/or with those with their headquarters in central and northern Italy including those in Tuscany, Lombardy and the Veneto for fabrics, polyesters, linings, cotton and wool, and by being more informal with local suppliers. Relations with most of the external buyers are established in the course of events reserved exclusively for industry professionals. Participation in local and national events, including Pitti Immagine Bimbo, reaches 67%, with just under 28% of firms which also participate in fairs and shows taking place in France, in the United Kingdom, in Spain, in Japan, in Russia and in the U.S.A.

The firms that perform processing innovation (31%) –see Fig.29 - also equip themselves with the latest hardware and software of an operational nature. They produce clothes that not only require the use of a traditional production process, but also technical sportswear and outerwear, including jackets, coats and padded jackets, which require the use of new machinery, teletechniques and products certified as environmentally friendly or non-allergic. These firms coincide with those that spend more on R&D and marketing. In this case the innovation is radical, the tacit knowledge and the Social Capabilities prevail and consequently the geographical proximity is important even if this correlation is not evident in the empirical results because there are few firms that commit in this kind of innovation (Lundvall, 1992; Mailat, 1991).

It should be added that the innovation process culminates in the use of CAD (Computer Aided Design) or CAM (Computer Aided Manufacturing), in order to improve production efficiency. In 85.7% of cases (Fig.34) the prototypes are processed and manufactured using CAD or CAM and Nonaka and Takeuchi’s externalization is high. The CAD or CAM use involves people interacting and combining knowledge. In other cases they are drawn by hand. The firms also carry out experiments with regard to processes in 40.5% of cases and the product in 97.6%. 35.7% of surveyed firms are also careful to innovate with regard to their organization, through the relocation of some high labour intensity production processes, maintaining the entire procedure of design, fashion and innovation, the creators of value, ‘in house’.

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The lively innovative performance, remarked in this traditional sector, reflects the importance that is attributed to the exchange of information and knowledge.

Great importance is attributed (in 100% of cases) to information relating to innovative knowledge and the market, obtained mostly from trade fairs (77%), national and international markets (81%), customers (75%), specialist magazines (67%) and contacts with other IT firms in same sector (65.5%). Knowledge is also acquired by contacts with other foreign firms in the same sector (57%), contacts with commercial agents (57%), contacts with suppliers both internal and external to the district (51.18%), by consulting specialist journals (43.3%) and through the association (49%). (Tab. 18).

**Table 18** – The sources of information connected to innovation knowledge and market knowledge in the baby clothes (2011)

<table>
<thead>
<tr>
<th>Source information</th>
<th>Typology of knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Innovation knowledge (%)</td>
</tr>
<tr>
<td>Trade Fairs</td>
<td>79.0</td>
</tr>
<tr>
<td>Specialized magazines</td>
<td>64.3</td>
</tr>
<tr>
<td>National and International market</td>
<td>83.3</td>
</tr>
<tr>
<td>Contacts with other IT firms in same sector</td>
<td>69.0</td>
</tr>
<tr>
<td>Suppliers</td>
<td>54.8</td>
</tr>
<tr>
<td>Clients</td>
<td>76.2</td>
</tr>
<tr>
<td>Associations</td>
<td>50.0</td>
</tr>
<tr>
<td>Conference</td>
<td>2.4</td>
</tr>
<tr>
<td>Institution</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: our analysis of the survey data
7.4.3 The Knowledge Sharing in the Modern Baby Clothing Industrial District

Considering the results of the baby clothing case study we can say that it has the characteristics of a modern industrial district and it differs in some aspects from the traditional industrial district. In fact it is a very dynamic district and the internationalization is not purely commercial. As we have highlighted, the internationalization has led to changes in the organizational structure of many firms and it has required high expenditure in R&D.

Taking into consideration the characteristics of the traditional Marshallian industrial district, the baby clothing district is characterized by the presence of small and medium firms, it has low-level economies of scale and key investment decisions are made locally. The raw materials originate from outside, but unlike a Marshallian district, the use of internationalization and relocation of manufacturing operations with a higher labour intensity is more prevalent. Contextually, it exists 100% Made in Italy firms as the results demonstrates. The final product is sold both within and outside the district and like the “Marshallian” district, it is special in terms of the nature, quality and flexibility of the local job market with workers moving between firms within the district and being more strongly tied to the district than to the particular enterprise that may employ them.

Unlike the typical Marshallian district, empirical analysis shows that the baby clothing district as the wedding dresses one, is characterized by a territorial proximity and not an agglomeration. Considering the importance of international relationships we can say that it is also significant the geographical dispersion. For these characteristics the flows of external and internal knowledge are very important, but the district is a place where a firm individual knowledge is not transformed directly into district knowledge, even though the district is characterized by homogenous culture that gives the possibility to diffuse rapidly new common knowledge.

The baby clothing district is characterized by frequent vertical interactions with internal and external suppliers-buyers and internal and external customers (Figure 35), by frequent horizontal interaction with other internal and external firms. Many firms internal to the district are under contract, others are direct competitors, while with businesses outside the district, license agreements and sub-contracts are signed. The interactions with associations such as consortia are important, but the interactions with institutions do not carry equal weight. Therefore vertical and horizontal interactions are very important in this district. In particular the firms in the sample, as far as the wedding clothing firms in the sample are concerned, establish frequent and cooperative
relationships with internal and external suppliers with whom the ties are strengthened and to which the deeply-entrenched relationships with their supply network and contract workers can be added. All these relationships are very numerous in this district. It follows that the sample firms have important formal and informal ties with other local firms. The intensity of formal and informal relationships with firms outside the industrial district is also very important and relevant. One can conclude that taking into consideration the importance of the different typologies of interactions or ties evidenced in Chapter 2, in these district strong relationships characterized by frequency, cooperation and trust prevail. In the baby clothing district another communication channel of some importance is derived from membership of the consortium, as firms exchange information on changes to their internal markets and outlets and on planned exhibitions in which they will be taking part. The consortium, in fact, is a bridge (Powell and Grodal, 2005) because it is a point of connection, the link that makes weak ties possible.

**Figure 35** – The knowledge diffusion in the modern Baby clothing district

As we have highlighted considering the survey results, there are firms that have diversified their production, know-how and part of the value chain, achieving economies of scope. These firms that we can identify as the pioneer firms of the two districts, in fact, due to the diversification of the asset, produce men, women and children’s ceremonial wear, at the same time, extending their production to casual and/or classic babywear. In this way they are able to build relationships/ties and enjoy the positive spillovers of districts, constituting a point of union between the two examined districts (Fig. 36) and important centre of knowledge sharing and creation.

In this way the pioneer firms become the stars of the two districts. Only the stars have ties with the other district firms which do not have ties, or just a few, each other. The stars can spread knowledge and could acquire knowledge from the two industrial firms through workers’ mobility, suppliers,
formal and informal meetings. The stars decide also if or not to pass the knowledge and in what measures and according to the literature this communication can be intentionally or not (Witt et al, 2007). We must also remember that the knowledge creation and diffusion depend on the individual absorptive capacity (Witt et al, 2007), on Cohen and Levinthal’s (1989) organization “absorptive capacity” and on the Social Capabilities. In the Special industrial district potentially all firms can connect to each other, can communicate and exchange information and knowledge with every other internal and external firms, internal and external suppliers, internal and external customers. The stars in this case study have not a hierarchical position and the relationship is bidirectional with other firms.

For this reason, within the two examined districts, adding further channels of communication such as the high mobility of labour that involves not only an important connection among the firms of the wedding district where part-time workers predominate, but also between the two districts, when firms who make wedding clothing differentiate the product and also manufacture clothing for children. Another communication routes can be identified in the participation in sectorial fairs and events, in the distribution of catalogues both in print and/or online as well as in the extensive use of the websites for advertising and sales for children’s clothes.

**Figure 36 - Special Industrial district**

![Diagram of Special Industrial districts](image)

Legend:
- Internal suppliers
- External suppliers
- External Customers
- Firm
- Sub-contract
- Institution
- Consortium
- Pioneer Firm
7.5 Conclusion

In this chapter we have described the original results of the surveys carried out on a sample of entrepreneurs in the field of a wedding dresses and baby clothing industrial districts utilizing a multi-method approach considering the difficulty to obtain valid answers. Through the survey, in fact, we have verified our conceptual framework. In other words, for both the examined districts, we have started with the description of the producers’ general characteristics and more specifically we have focused our attention on the role of knowledge, Social Capabilities and innovation on one side and on the knowledge creation and diffusion in the two modern industrial districts on the other. An analysis of the results of the two case studies suggests, in fact, that they do not have the characteristics of the industrial districts identified in the literature (Marshall, 1980; Becattini, 2000; Brusco, 1989; Markusen, 1996; Guerrieri and Pietrobelli, 2004, 2006; Paniccia, 2005), but instead they are modern industrial districts with some peculiarities that differentiate them within the same territorial setting. Like the traditional Marshallian industrial district the two districts in general have low-level economies of scale, key investment decisions are made locally, raw materials originate from outside and they are characterized of the local job market flexibility. Unlike the traditional Marshallian industrial district are characterized by territorial proximity (Boschman and ter Wal, 2007) and not by an agglomeration (Brusco, 1989, 1991; Becattini, 1979, 1989, 2002); the use of internationalization and relocation of manufacturing operations with a higher labour intensity relating only to baby clothing district; a firm individual knowledge is not transformed into district knowledge; the cooperation with the competitors is absent and it does not exist a synergy with the institutions. But these districts are modern districts not only because the existence of social and firm networks, observation for imitation and human resource mobility, but also because of the presence of pioneer firms characterized by a specific innovation capability and internationalization process and because of the existence of external resources of knowledge and innovation given to the external relationship.

According to the theoretical part, the results of the case study show that the relationship among knowledge, Social Capabilities and innovation does not only involve large enterprises but small and medium-sized businesses as well. Innovation in fact does not only consist of an investment in research and development and in the adoption of new technologies, but it also consists of the gradual change of types of product, new processes, adapting to constant changes in consumer tastes, implementing new organizational methods, both internally and in their relationship with other firms, customers and suppliers as well as creating new types of contracts, means of distribution, marketing and design innovation (Cappellin, 2010; Tether et al., 2005).
The firms in our sample represent the organization where knowledge is not produced through a process of the integration of learning and formal research, but they represent places of specific competences and capacities. On the contrary, the issue of training leads neatly to the characterization of an industrial district, as tacit knowledge is transmitted through learning by doing. This having been said, the sample firms underestimate the importance of investing in human capital, training and the formation of general skills and specific skills (Becker, 1964) so important in determining productivity and growth as we have underlined in the theoretical part. Many of the firms, especially in the wedding clothing sector where tailoring dominates, require specific skills which cannot be provided by general-purpose education and new technologies, and organizations require continuous learning, best accomplished by workplace training.

According to the theoretical framework, the mechanism for knowledge transfer, creation and combination in the two modern industrial districts are the social and firm networks; human resources and workers’ mobility and the observation for imitation. Other communication channels are the participation in sectorial fairs and events, in the distribution of catalogues and the extensive use of the websites. At the same time we have verified that the four modes of knowledge conversion of the NTM are presents in the two districts. More precisely in these modern industrial districts the knowledge creation is derived from a continuous and dynamic interaction between the internal and external sources of tacit and explicit knowledge.

From the results of the survey it was also found that the performance, class size and the strategic choices in the two sectors examined are different even though the firms are located in the same area. This reflects the presence of a range of enterprises characterized by specific features, in the same local context where the firms at work are characterized by high flexibility and adaptability to demand for which they are able to create market niches given the specific nature of the product, but still they suffer from international competition. In fact, the wedding sector is characterized by a presence of micro- and small-sized firms to which casual and seasonal worker can be added, the baby clothing sector is characterized by a presence of small- and medium-sized firms which commit in more innovation. The firms in the wedding sector do not relocate their production activities abroad in order to maintain the high quality of the product, but they limit this to the marketing, through the signing of contracts with agents, importers and distributors. By contrast the firms in the baby clothes are very dynamic and the internationalization is most prevalent. By internationalizing some phases of the production process with higher labour intensity, firms are able to reduce production costs and satisfy the consumer. The carried out analysis instead shows that in the two sectors the firms that are direct competitors producing goods that are close substitutes do not cooperate each other, limiting themselves to exchange information on suppliers or distributors to
reduce transport costs, while no innovative knowledge or market information is exchanged. The intensity of cooperative relationships with suppliers, both local, national and international, is very important as the relations with the majority of external buyers are established at events reserved for professionals working in the sector. The relationships with customers are particularly important in the wedding sector because the innovation product is inducted from the demand. It does not seem, however, that there is a sense of belonging to the district, that is to say of social capital, a concept as we have seen in Chapter 3, introduced by Bourdieu in 1980, and defined as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition and belonging to a group as a set of agents not only with common properties, but also linked by permanent and useful ties” (Bourdieu, 1980, p.2). It would seem, therefore, that in districts making up our study there is a lack of belonging and confidence that goes on to impact on the types of relationships that are established among the agents in the district. In the sectors in our case study, according to the theoretical part (Chapter 2) there are strong ties within a particular enterprise as these are often family-run structures that are typical of the southern Italian industrial district, while with the other agents weak ties are most common (Granovetter, 1973; 1985). Their strength lies in the fact that through weak ties, people moving in different environments are more likely to come into contact with people who have information and useful contacts for both the employer and the employee, becoming, in fact, a source of information that enables the mobility of labour. The importance of establishing ties outside a small circle of friends and family that characterizes the strong bonds is that the information circuit ends up being too small, but the sense of cooperation and trust is higher. Thus, paradoxically, the rather weak ties, driven by opportunism, are needed to integrate oneself into a community that is part of a district.

But in a global market where the industrial district is global and not only local, open district takes advantage and more performance from the embeddedness external knowledge, new resources, new competences and new ties. This becomes possible thanks not only to the absorptive capacity and thanks to the capabilities to absorb external knowledge, but also for the presence of Social Capabilities that referred to the industrial district given the possibility to enlarge knowledge learning process and network diffusion to improve the innovative performance of the industrial district.

Given the complexity to measure the Social Capabilities, as already remarked at the beginning of this chapter and in the theoretical part of this work (Chapter 3), and considering the importance of these inputs in stimulating innovative activity, it is necessary to develop another chapter. In the Chapter 8 in fact we measure the Social Capabilities using the scoreboard approach (Hollander and
van Cruysen, 2009; IUS Report, 2011), we analyse the Social Capabilities diffusion in the wedding dresses, in the baby clothing industrial district and in the special industrial district. We develop the academic classification and we estimate an innovation equation.
CHAPTER 8:

MEASURING SOCIAL CAPABILITIES USING THE QUESTIONNAIRE

8.1 Introduction

In Chapter 7 we have described the original results of the survey carried out on a sample of entrepreneurs in the wedding dress and baby clothing industrial districts and we have focused our attention on knowledge creation and diffusion and on the key role that knowledge, Social Capabilities and innovation play in the two examined industrial districts.

We have also pointed out in Chapter 3 that one of the major difficulties of the “Social Capabilities” concept is that it has not been quantified in the literature. In other words, not all indicators identified in the literature seem to explain Social Capabilities at least with reference to industrial districts and do not seem to be entirely consistent with the definition of Social Capabilities given in this work.

In this chapter we implement the Social Capabilities definition through the use of a questionnaire (Appendix C) and we propose a measure of Social Capabilities using a simple perception index. In this way, we explain each question used in the questionnaire to implement, explain and measure the Social Capabilities. This exercise is useful to measure Social Capabilities and to obtain information that enables to have the development of qualitative and quantitative variables and their relative indicators.

The measure of Social Capabilities using a simple perception index could reveal the starting point and it could represent an innovative contribution to the debate on Social Capabilities. There are in fact many questions and issues regarding the construction of this index.

The chapter is organized as follows: section 8.2 explains the methodology to measure the Social Capabilities and the questionnaire structure. The questionnaire in fact was structured in such a way that the answers would be useful to assess Social Capabilities through the construction of composite indicators. To measure the Social Capabilities we used the scoreboard approach (Hollanders and van Cruysen, 2009; IUS Report, 2011) while for the construction of the composite indicators we were guided by an OECD Handbook (2008). In sections 8.3, 8.4 and 8.5, we measure the Social Capabilities respectively in the Wedding Clothing district, in the Baby Clothing district and in the Special Clothing district. In section 8.6, instead, we present the empirical analysis estimating an innovation equation in this Special Clothing district to consider the impact of Social Capabilities in stimulating innovative activities in this industrial district performance. The conclusion is in 8.7.
8.2 The Questionnaire and the Social Capabilities Indicators

The aim of this section is to explain how we use the questionnaire to measure the Social Capabilities and to implement the Social Capabilities definition given in this work on one side and to explain how we construct the single indicators and the composite indicator to measure the Social capabilities on the other side.

Before starting with the measurement of Social Capabilities in an industrial district, one should recall briefly the definition and elements of Social Capabilities presented in the theoretical part of this work and the concept of industrial district introduced in Italy in 2006 and used in this work. As we have emphasized in Chapter 3, in this research, the adopted definition of Social Capabilities is associated with enlarging the knowledge-learning process and network diffusion and plays a key role in the transfer and diffusion of tacit knowledge within an industrial district. The characteristics and the elements of the Social Capabilities in an industrial district (Table 1 in Chapter 3) include:

- geographical proximity – dispersion for the Spatial conditions,
- tradition, social relationships, skills and ability, knowledge, learning for the Social conditions,
- innovation, human resources, organization, knowledge, markets, firm relationships, internationalization for the Economic conditions;
- social and political institutions for the Political conditions
- technological and organizational progress for the Innovation.

All these characteristic and elements have driven our survey and the identification of indicators and variables to measure the Social Capabilities.

The industrial district concept adopted in this work, instead, stresses the aggregation or geographical proximity (Boschma and ter Wal, 2007) of specialized firms in a homogenous productive contest, where the geographical proximity facilitates knowledge sharing and interactive learning and innovation. But it is necessary to increase the Social Capabilities both “... when they are better connected, and when they participate in the local network” (Boschma and ter Wal, 2007, p.6). When the industrial district is global, the relationships that firms within a district can create for themselves with the outside world must be added, because these are a very important source of new knowledge and innovation and a source of creation of new internal knowledge for businesses in the district.
Taking into account these aspects discussed in the theoretical part, we must also remember that there are few works that have estimated and measured Social Capabilities, and that studies, which have constructed an indicator that measures Social Capabilities in an industrial district, are unknown in the literature. Measuring Social Capabilities is therefore very complex since not all the highlighted elements can be subject to empirical verification and since they are intangible, residual and often incorporated into tacit knowledge and a literature that can help us in defining and measuring them accurately is not always available for all the elements. In other words, not all indicators identified in the literature, in fact, seem to explain the Social Capabilities at least with reference to the industrial district and do not seem to be entirely consistent with the definition of Social Capabilities given in this work.

Social Capabilities, in fact, are usually non-market and non-accounted in regional and national dataset. The only consistent way to identify the Social Capabilities characteristics, elements, indicators and their related variables is by implementing survey-based approaches aimed at producing specific information by structured questionnaires (see Appendix C).

We have therefore divided the questionnaire to reflect the indicators and variables that make up Social Capabilities and that allow us to measure them. Each question implements the elements of the Social Capabilities in an industrial district identified in the literature and permit the development of qualitative and quantitative variables used to construct the indicators and the composite indicator. To construct the single indicators and the composite indicator to measure the Social Capabilities, we are guided by the OECD Handbook (2008), and we adopt the “scoreboard approach”

61 As we have seen in Chapter 3, Ho Koo (1995), following Abramovitz, has studied the Social Capabilities with reference to the industrialization and economic growth of Korea; Temple and Johnson (1998) have developed an index based on the interrelation of economic and non-economic forces.

62 As we have stressed in Chapter 3, in the literature there is often recourse to the use of proxies like those used for human resources, such as education levels and technological capabilities, incorporated in people and not in machines. Since it is very difficult to measure institutions, researchers often refer to the nature of the government and infrastructure in progress. Among the economic performance indicators of a district, its social absorption capabilities can be used (Hurwicz 1995; Dahlan and Nelson 1995), they include education and some related variables such as school enrolment. To these, indicators relating to R&D, the stock of direct foreign investment and the import of capital goods are added together with the gross domestic product per capita, even if they are not, in my humble opinion, directly included in the Social Capabilities, but they are rather economic performance indicators.

63 The definition that the OECD gives to the composite indicator is the following: “...simplistically a composite indicator synthesizes the information included in a selected set of indicators and variables”. “A composite indicator or synthetic index is an aggregate of all dimensions...” (OECD Handbook, 2008 p. 15). In the OECD Handbook (2008) is emphasized that the debate is open when indicators or composite indicators are utilized with complex concepts in social sciences like citizenship, wellbeing, cohesion, and learning and to measure abstract concepts such as knowledge. Qualitative information is often used, richer in detail, but context dependent and hardly replicable in space and time. The main virtue of a composite indicator is that it can summarize complex issues. The creation of a composite indicator requires a balance among different aspects, all equally important in defining the quality and the usefulness of the composite.

The steps in the construction of composite indicators are the follow:
With the composite indicator use, in fact, an observed phenomenon is measured using a set of indicators which catch some of the key elements of that phenomenon. It synthesizes the information included in a selected set of variables and it is utilized with complex concepts in social sciences and in knowledge. This composite indicator should be seen as a starting point to start a discussion and to appeal to public interest.

As we have evidenced before, the indicators to be included in the analysis are identified with the help of literature and with the results of the questionnaire. We have therefore divided the questionnaire to reflect the indicators that make up Social Capabilities and that allow us to measure them. The questionnaire utilized is structured on five main levels: (i) general information about the firm and about the function of the respondent; (ii) an exploration of the innovation and marketing activities of the firm; (iii) the collection of data on knowledge exchange with the use of source information connected to innovation knowledge and market knowledge; (iv) the collection of information on common space in a firm, number of formal or informal meetings; (v) the gathering of information about contact with institutions, suppliers, customers and other firms, their location and the type of firm in question and the nature of the connections.

(i) In the first part we obtain information about the role of the interviewed person and about the firm location; the firm activities; when the activity started;

- Theoretical framework. A theoretical framework is important to provide the basis for the selection and combination of single indicators into a composite indicator. The theoretical framework should define the phenomenon to be measured and its sub-components and select individual indicators that reflect their relative importance.
- Variable selection. This step is very important because the strengths and weaknesses of composite indicators derive from it. But while the choice of indicators must be guided by the theoretical framework, the data selection process can be quite subjective. Because of a scarcity of quantitative (hard) data, composite indicators often include qualitative (soft) data from surveys. However the use of soft data entails the risk of introducing significant measurement errors in the overall composite scores.
- Imputation of missing data when data sets are not complete, but it is a real art. The methods are three in general: i) case deletion, ii) single imputation or iii) multiple imputations.
- Multivariate analysis. An exploratory analysis should consider the interrelationship among the individual indicators.
- Investigate. This step is important because it will guide in the methodological choices, e.g., weighting and aggregation, during the construction of the composite indicator.
- Normalization. Indicators should be normalized to make them comparable.
- Weighting and aggregation. This implies a decision on which procedure will be applied to aggregate the data.

If the variables have not high degree of correlation, the index aggregation is done by the addition method (Nardo et al. 2005). Combining variables with a high degree of correlation, the use of equal weights could involve the risk of double counting: if two collinear indicators are included in the composite index with a weight of 1 w and 2 w, the dimension that the two indicators measure have is (w1 +w2 ). Furthermore, minimizing the number of variables in the index may be desirable on other grounds, such as transparency and parsimony.

We use the “scoreboard approach” methodology (Hollanders and van Cruysen, 2009; IUS Report, 2011) to consider the steps in the construction, presentation and division in groups of the composite indicators. This approach is used to measure design, creativity and innovation in the EU countries.
(ii) In the second part we obtain information about number of full time employees; number of full time employees in R&D, Design (D); the expenditure for R&D, D\textsuperscript{65}, Learning and Skills; the place of design activities. We have information about introduction of new product, processes or organizational methods and demand-driven innovation; prototypes number; CAD or CAM use; marketing expenditure, web marketing use, on how the firm moves into new market segments.

(iii) In the third part we obtain information about the source information connected to innovation knowledge (IK) and market knowledge (MK) (the innovation knowledge consists of new materials, more efficient methods of production, new machinery, new techniques, new designing technologies; the market knowledge consists of keeping information on the consumers’ preferences, on the new national and international markets, the latest trends in colours and materials). In this part we also measure institutional networks and firms network.

(iv) In the fourth part we obtain information on common space in a firm, number of formal or informal meetings in a month among manager and customers, manager and suppliers, researcher and customers, manager and manager, researchers and researchers and so on to measure social network in a district.

(v) In the last part we obtain information about contact with other firms, its location and type of firm (if suppliers, clients, competitors) to measure scanning abilities for social and firm network. We consider the partner’s type and the importance of exchange of information/knowledge.

8.3 The Social Capabilities Indicators and the Scoreboard Approach

With the help of literature and through the results of the questionnaire in which, as we have described in the precedent section, each question implements the characteristics and the elements of the Social Capabilities, to measure the Social Capabilities we adopt the “scoreboard approach”. With this approach the observed phenomenon is measured using a set of main indicators, in our case 8 indicators\textsuperscript{66} which catch some of the main elements of the phenomenon. These 8 indicators are identified together with 71 variables. The connection among the 8 indicators and the Social Capabilities characteristics is the following (Table 19):

\textsuperscript{65} See footnote 48
\textsuperscript{66} Because of the scarcity of internationally comparable quantitative (hard) data, the indicators often include qualitative (soft) data from surveys.
Geographical Space (GS) determines the spatial conditions; Social Networks (SN) represent the social conditions; economic conditions are represented by Firm Networks (FN) and Knowledge Exchange (KE) that is formed by the Knowledge Exchange connected to Innovation Knowledge (KE from IK) and the Knowledge Exchange Connected to Market Knowledge (KE from MK); that of Institutional Networks (IN) determines the political conditions while Innovation Capabilities (IC) and Marketing Capabilities (MC) determine innovation.

Table 19 - The Social Capabilities indicators

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Indicators</th>
<th>Time Period</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Spatial conditions</td>
<td>Geographical Space (GS)</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>B. Social conditions</td>
<td>Social Networks (SN)</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>C. Economic condition</td>
<td>Firm Networks (FN) and Knowledge Exchange (KE) or the Knowledge Exchange connected to Innovation Knowledge (KE from IK) and the Knowledge Exchange Connected to Market Knowledge (KE from MK)</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>D. Political conditions</td>
<td>Institutional Networks (IN)</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>E. Innovation</td>
<td>Innovation Capabilities (IC) and Marketing Capabilities (MC)</td>
<td>2011</td>
<td></td>
</tr>
</tbody>
</table>

The most widespread linear aggregation is used to measure the SC composite index. It consists of the average value of normalized indicators:

\[
(1) \quad SC_f = \frac{1}{n} \sum_{q=1}^{Q} I_{qf}
\]

with \( \sum_{q} I_{qf} \) for all \( q = 1, \ldots, Q \) and \( f = 1, \ldots, M \), where \( I_{qf} \) is the individual or single normalized indicator \( q=1,\ldots,Q \), for firm \( f=1,\ldots,M \) and \( n \) represents the normalized indicator numbers. The SC results are presented in the last column of Tables 21 and 25.

In this way the SC includes 8 normalized indicators (see Table 20). They are:

- GS represents the geographical space identified by 1 indicator
- SN represents the social network identified by 5 indicators; of these, in turn, two are formed by 11 variables
- FN represents the firm network identified by 4 indicators

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67 We use this method because, quoting Nardo et al. (2005), most composite indicators rely on equal weighting. But they add that “These could correspond to the case in which all variables are “worth” the same in the composite but also it could disguise the absence of statistical or empirical basis, e.g. when there is insufficient knowledge of causal relationships or a lack of consensus on the alternative.” (Nardo et al., 2005, p.21). In any case they observe that it does not exist an “objective” way of determining a composite indicator. It is important that the entire process is transparent (Nardo et al., 2005, p.23).
IN represents the institutional network identified by 4 indicators
KE from IK is the knowledge exchange connected to innovation knowledge identified by 8 indicators
KE from MK is the knowledge exchange connected to market knowledge identified by 8 indicators
IC represents innovation capabilities identified by 12 indicators
MC represents market capabilities identified by 9 indicators

Table 20 – Social Capabilities indicators, variables and measures with the scoreboard approach

<table>
<thead>
<tr>
<th>Indicators/Variables</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Geographical Space</strong></td>
<td></td>
</tr>
<tr>
<td>A.1 geographical proximity</td>
<td>( X_{\text{min}} = 1 ) if the firm is in Putignano; ( X_i = z \text{Km from Putignano} ), where ( z ) is the distance from Putignano</td>
</tr>
<tr>
<td><strong>B. Social Network</strong></td>
<td></td>
</tr>
<tr>
<td>B.1 the existence of common space in the firm</td>
<td>1 = if yes; 0 = if no</td>
</tr>
<tr>
<td>B.2 number of formal meeting in a month among</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2a manager and customers,</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2b manager and suppliers,</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2c researcher and customers,</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2d manager and manager,</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2e researcher and researcher,</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2f workers and workers,</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2g manager and workers</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2h researcher and workers</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2i researcher and designer</td>
<td>from 0 to 5 meetings in a month</td>
</tr>
<tr>
<td>B.2j researcher and stylist</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td><strong>B.3 number of informal meetings in a month among</strong></td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3a manager and customers,</td>
<td>from 0 to 5 meetings in a month</td>
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<td>B.3b manager and suppliers,</td>
<td>from 0 to 5 meetings in a month</td>
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<td>B.3c researcher and customers,</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3d manager and manager,</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3e researcher and researcher,</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3f workers and workers,</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3g manager and workers</td>
<td>from 0 to 5 meetings in a month</td>
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<td>B.3h researcher and workers</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3i researcher and designer</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td>B.3l researcher and stylist</td>
<td>from 0 to 5 meetings in a month</td>
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<td>B.3m manager and stylist</td>
<td>from 0 to 5 meetings in a month</td>
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<tr>
<td><strong>B.4 suppliers’ number</strong></td>
<td>From 1 to 3 = 1; from 4 to 10 = 2; from 11 to 50 = 3; more 50 = 4</td>
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<tr>
<td><strong>B.5 customers’ number</strong></td>
<td>From 1 to 3 = 1; from 4 to 10 = 2; from 11 to 50 = 3; more 50 = 4</td>
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<tr>
<td><strong>C. Firm Network</strong></td>
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<tr>
<td>C.1 Number of formal and informal contacts with other Italian companies in the same industrial sector</td>
<td>From 1 = not important to 5 = very important</td>
</tr>
<tr>
<td>C.2 Number of formal and informal contacts with foreign companies in the same industrial sector</td>
<td>From 1 = not important to 5 = very important</td>
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<td>Section</td>
<td>Description</td>
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<tr>
<td>C.3</td>
<td>Number of contacts with suppliers in Italy and/or abroad</td>
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<td>C.4</td>
<td>Number of contacts with commercial agents in Italy or abroad</td>
</tr>
<tr>
<td>D.</td>
<td>Knowledge Exchange connected to:</td>
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<tr>
<td>D.1</td>
<td>Knowledge Exchange connected to Innovation Knowledge</td>
</tr>
<tr>
<td>D.1a</td>
<td>Trade Fairs</td>
</tr>
<tr>
<td>D.1b</td>
<td>Specialized magazines</td>
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<tr>
<td>D.1c</td>
<td>National and International market</td>
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<tr>
<td>D.1d</td>
<td>Formal or informal contacts with other IT firms in same sector</td>
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<td>D.1e</td>
<td>Formal or informal contacts with other foreign firms in same sector</td>
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<tr>
<td>D.1f</td>
<td>Contact with commercial agents in IT and abroad</td>
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<td>D.1g</td>
<td>Suppliers</td>
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<td>D.1h</td>
<td>Clients</td>
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<td>D.2</td>
<td>Knowledge Exchange Connected to Market Knowledge</td>
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<td>D.2a</td>
<td>Trade Fairs</td>
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<tr>
<td>D.2b</td>
<td>Specialized magazines</td>
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<tr>
<td>D.2c</td>
<td>National and International market</td>
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<td>D.2d</td>
<td>Formal or informal contacts with other IT firms in same sector</td>
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<td>Formal or informal contacts with other foreign firms in same sector</td>
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<td>Contact with commercial agents in IT and abroad</td>
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<td>Suppliers</td>
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<td>D.2h</td>
<td>Clients</td>
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<td>E.</td>
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<td>F.4</td>
<td>The importance of association</td>
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<td>F.1</td>
<td>Researchers number/Employees number full time</td>
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<td>Investment in R&amp;D and D</td>
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<td>CAD or CAM use</td>
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<td>Process experiments number (prototype)</td>
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<td>Design activities carried out in house or with other firms</td>
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<td>G.1</td>
<td>Marketing expenditure</td>
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<td>G.7</td>
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<td>Trade Fair participation</td>
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<td>G.9</td>
<td>Market knowledge</td>
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</tbody>
</table>

We have normalized\(^{68}\) the variables counted in the normalized indicators for each firm in the time period, with the “Min-Max” method (2),

\[
J_{af}^{*} = \frac{x_{af} + \min_{f}(x_{q}^{f})}{\max_{f}(x_{q}^{f}) - \min_{f}(x_{q}^{f})}
\]

\(^{68}\) The normalization of the variables is usually necessary when there are variables that differ from measurement unit or they are not comparable. See note 62 for more detail.
where $I_{af}^t$ is the normalized indicator at time $t$, $q_f$ is the firm number; $x_{af}^t$ is the considered variable; min ($x_q^t$) and max ($x_q^t$) are the minimum and the maximum value of $X_{af}^t$ across all $f$ at time $t$.

In this way the normalized indicator $I_{af}^t$ have values lying between 0 (laggard $X_{af}^t = \min_f(x_q^t)$) and 1 (leader $X_{af}^t = \max_f(x_q^t)$).

The choice of the indicators is explained as follows:

**A. GEOGRAPHICAL SPACE (GS)**

It is a concentration/dispersion of firms in a localized space as an industrial district.

**A.1 Geographical proximity** (Boschma and ter Wal, 2007; Cainelli and Lupi, 2011).

The literature (Howells, 2002; Giuliani, 2005; Boschma and ter Wal, 2007; Cainelli and Lupi, 2011) emphasizes the importance of geographical or spatial proximity of specialized firms in a homogenous productive contest. It influences knowledge interactions (Howells, 2002); it facilitates knowledge sharing and interactive learning and innovation. It stimulates face to face interactions among economic agents (firms and individuals), it facilitates the rapidity of diffusion of ideas, information (on new products, production processes, and markets), types of knowledge (codified and tacit), causing differences not only in productivity at firm level, but also in growth rates at the local level (Cainelli and Lupi, 2011), and the observation for imitation (Camuffo and Grandinetti, 2006). But it is necessary to add absorptive capacity (Giuliani, 2005) of the firm, of the individual (Witt and al., 2007) and their Social Capabilities “…when they are better connected, and when they participate in local network” (Boschman and ter Wal, 2007, p.6). Considering Cainelli and Lupi’s method in which the spatial proximity is calculated using a direct measure of physical distances between pairs of firms in kilometers (Cainelli and Lupi, 2011) - with which it is possible to catch the rate at which knowledge spillovers limited over space -, in this work, the GS is calculated using a direct measure of physical distances between the location of the district (Putignano, the core of the districts where the firm concentration is high as it is resulted by the case studies) and the operating headquarters of the firms in kilometers.

In this case, considering that in the Cainelli and Lupi’s paper (2011) they find that localization effects are positive but they decrease with distance, our hypothesis is: min ($x_q^t$)=1 if the firm is in Putignano and $X_{af}^t=z$ Km from Putignano where $z$ is the distance from Putignano in kilometers. In this work the result takes the value 1 if the firm is localized in Putignano, in the core of the district and 0 otherwise.
B. SOCIAL NETWORK (SN)

One of the most important elements of knowledge that is emphasized by literature (see Chapter 2) is its relational characteristics (Polanyi 1966; Nonaka and Takeuchi, 1995; Howells, 2002; Metcalfe and Ramlogan, 2005; Foray, 2006; Witt and al., 2007; Camuffo and Grandinetti, 2006) and its value which comes from learning by interaction (Lundvall, 1992; Antonelli G. and Nosvelli, 2008), and from social networks (Granovetter, 1973; Powell and Grodal 2005; Burt, 1992). The greater the interactions among actors, the more the development of a common language and ideas and the transfer of knowledge become easier. In a district, social networks form more easily and stimulate transfers of information/knowledge and inputs that transform into new knowledge depending on the abilities of the actors.

To measure social network in a district we consider:

B.1 The existence of common space in the firm

According to the theoretical framework, the existence of common space in the firm permits the continual exchange of ideas, information and knowledge.

It is measured in the following manner: a value “1” being attributed if the firm in question has a common space, otherwise “0”.

When individuals interact within local space or context, personal knowledge is increased and it becomes interdependent. It becomes social knowledge that is collective, and that is derived from individual interactions through formal or informal meetings.

B.2 The number of formal meetings in a month and the relative measure is the following:

B.2a manager and customers (from 0 to 5)
B.2b manager and suppliers (from 0 to 5)
B.2c researcher and customers (from 0 to 5)
B.2d manager and manager (from 0 to 5)
B.2e researcher and researcher (from 0 to 5)
B.2f workers and workers (from 0 to 5)
B.2g manager and workers (from 0 to 5)
B.2h researcher and workers (from 0 to 5)
B.2i researcher and designer (from 0 to 5)
B.2l researcher and stylist (from 0 to 5)
B.2m manager and stylist (from 0 to 5)

The formal meeting consists of a workshop, seminar, conference or a meeting taken on a previous appointment.
It is measured considering the possibility that in a month the formal meetings may range from 0 to 5.
In this way the normalized indicator $I_{af}$ takes the value 1 if the formal meetings are max; 0 otherwise.
The composite indicator B2 is calculated through the average value of the normalized variables (from B.2a to B.2m).

B.3 The number of informal meetings in a month and the relative measure is the following:
B.3a manager and customers (from 0 to 5)
B.3b manager and suppliers (from 0 to 5)
B.3c researcher and customers (from 0 to 5)
B.3d manager and manager (from 0 to 5)
B.3e researcher and researcher (from 0 to 5),
B.3f workers and workers (from 0 to 5),
B.3g manager and workers (from 0 to 5)
B.3h researcher and workers (from 0 to 5)
B.3i researcher and designer (from 0 to 5)
B.3l researcher and stylist (from 0 to 5)
B.3m manager and stylist (from 0 to 5)
The informal meeting consists of discussion without appointment, in other words it is an occasional discussion in an office, in a café, restaurant, by phone, on the road and so forth.
It is measured considering the possibility that in a month the informal meetings may range from 0 to 5.
The normalized indicator $I_{af}$ takes the value 1 if the informal meetings are max; 0 otherwise.
The composite indicator B3 is calculated through the average value of the normalized variables (from B.3a to B.3m).

B.4 The number of suppliers
Relationships which are established with suppliers are also important for the exchange of tacit knowledge. SC increases in line with the number of relationships that are established with suppliers. Through these relationships, one can get the latest fashion trends, new colours, and new fabrics and so on.
In this case, to measure them, the value 4 is assigned if the number of suppliers is more than 50, the value 3 if the number of suppliers is between 11 and 50, the value 2 if the number of suppliers is between 4 and 10 and the value 1 if the number of suppliers is between 1 and 3.

The normalized indicator $I_{\alpha f}$ takes the value 1 if the firm has good relationships, 0 otherwise.

**B.5 The number of customers**

The relationships that are established between the firm and customers are also important for the exchange of tacit knowledge as one can adapt to the demand and the SC increases with an increase in the number of customer relationships.

In this case, to measure them, the value 4 is assigned if the number of customers is more than 50, the value 3 if the number of customers is between 11 and 50, the value 2 if the number of customers is between 4 and 10 and the value 1 if the number of customers is between 1 and 3.

The normalized indicator $I_{\alpha f}$ takes the value 1 if the firm has good relationships, 0 otherwise.

To measure the SN we have used a composite indicator calculate as the average value of 5 normalized indicators (B.1; B.2; B.3; B.4 e B.5) where B.2 e B.3 are composed of 11 normalized variables.

**C. FIRM NETWORK (FN)**

Taking in account the theoretical part of this work, in an industrial district it is important to consider not only the social networks (the community) but also the firm networks (the industrial organisation). One firm, in fact, is not an island of planned coordination in a sea of market relations (Richardson, 1972). It is necessary to consider the linkages among firms, trading relationship, subcontracts, licences, the relationship with suppliers that help the exchange of capabilities, knowledge and technology. The existence of firm networks, in fact, facilitates and favours the knowledge diffusion thought vertical and horizontal integration (Camuffo and Grandinetti, 2006). It is also possible that two firms do not have a direct relationship, but an indirect relationship such as some suppliers as the description results of the survey demonstrate.

According to transaction cost theory and the resource-based view, the economic advantage from firm networks lies in the minimization of search and monitoring costs and the norms of reciprocity generated by social networks. The creation of norms promotes reciprocity and cooperation, which improve information and knowledge diffusion. Another part of the literature (Barney, 1986, 1991; Habeck et al., 2000; Howells, 2002 and Kogut and Zander, 1997) considers that among firms it is still difficult to transfer knowledge and especially tacit knowledge, because one firm might choose
to protect a particular innovation or competitive advantage. It is information - not knowledge - that
is transferred. Knowledge becomes available through publication, patents, informal networks, trade,
artefact and goods. It is possible for knowledge to be transferred between partners that are part of an
inter-firm cooperative arrangement or a strategic alliance (Collins and Hitt, 2006; Powell and
Grodal, 2005). In any given geographical area, the relationship among firms and the workers’
circulation facilitate the exchange of information and transform organizational/firm knowledge into
inter-organizational or district knowledge. In fact, when firms are spatially concentrated, knowledge
externalities will be more frequent and intensive (Krugman, 1991; Cainelli and Lupi, 2011). Thus
congressions of firms or spatial proximity have power and influence over knowledge interactions.
However, these will be dependent on the types of relationships that are established in terms of
horizontal and/or vertical integration.

To measure firm network in a district we use:

**C.1 Formal or informal contacts with other Italian companies operating in the same sector**

In particular, we consider whether the firm is in contact with other Italian companies operating in
the same sector, where the contact consists of an exchange of information. This contact also can be
formal if the company signs a contract or casual if it is based on mutual trust, as it is usually the
case in a district if the companies are local. We describe the partner's type if it is another firm, a
supplier, a customer, a commercial agents and the importance of the exchange of
information/knowledge.

To measure the formal or informal contacts with other Italian companies in the same sector a value
is assigned from 1 to 5. (1 = not important to 5 = very important).

The normalized indicator $I_{qf}$ takes the value 1 if the contact and the exchange of information are
important, 0 otherwise.

**C.2 Formal or informal contacts with foreign companies operating in the same sector**

In particular, we consider whether the firm is in contact with foreign companies operating in the
same sector, where the contact consists of an exchange of information. This contact also can be
formal if the company signs a contract or casual if it is based on mutual trust. We describe the
partner's type if it is another firm, a supplier, a customer, a commercial agents and the importance
of the exchange of information.

To measure the formal or informal contacts with other Italian companies in the same sector a value
is assigned from 1 to 5. (1 = not important to 5 = very important).
The normalized indicator $I_{Q_f}$ takes the value 1 if the contact and the exchange of information are important, 0 otherwise.

C.3 Contacts with suppliers in Italy and/or abroad
To measure the formal or informal contacts with suppliers in Italy and/or abroad a value from 1 to 5 was attributed. (1= not important to 5= very important). It is necessary to precise that in this case we have considered the supplier as a partner’s type or a business center.
The normalized indicator $I_{Q_f}$ takes the value 1 if the contact and the exchange of information are important, 0 otherwise.

C.4 Contacts with commercial agents in Italy and/or abroad
To measure the formal or informal contacts with other Italian companies operating in the same sector a value from 1 to 5 was attributed. (1= not important to 5= very important).
The normalized indicator $I_{Q_f}$ takes the value 1 if the contact and the exchange of information are important, 0 otherwise.
To measure the FN composite indicator we have calculated the average value of the 4 normalized variables C1, C2, C3 and C4.

D. KNOWLEDGE EXCHANGE (KE)
The sources of information/knowledge connected to innovation and particularly from INNOVATION KNOWLEDGE (KEfromIK) and MARKET KNOWLEDGE (KEfromMK) are also very important as we have underlined in the theoretical part, for a firm, and they depend on the capacity to decode, access and absorb knowledge from other sources as specified below (Rogers, 1983, Lane and Lubatkin, 1998; Cohen and Levinthal, 1989; Witt and al., 2007; Boshma and ter Wal, 2007; Giuliani, 2005; Nonaka, 1994; Nonaka and Takeuchi, 1995; Leoncini and Montresor, 2008). Important are also the fluxes of knowledge that can be shared in an industrial district through the observation for the imitation as we have remarked in Chapter 4.

KE from IK consists of the source information connected to knowledge innovation which consists of new materials, more efficient methods of production, new machinery, new techniques and new design technologies.
To measure KEfromIK in a district we use the source information connected to first part of the third level of questionnaire and particularly:

D.1a Trade Fairs (from 1: not important to 5: very important)
D.1b Specialized magazines (from 1: not important to 5: very important)
D.1c National and International markets (from 1: not important to 5: very important)
D.1d Formal or informal contacts with other IT firms in same sector (from 1: not important to 5: very important)
D.1e Formal or informal contacts with other foreign firms in same sector (from 1: not important to 5: very important)
D.1f Contact with commercial agents in IT and abroad (from 1: not important to 5: very important)
D.1g Suppliers (from 1: not important to 5: very important). In this case we consider the exchange of knowledge limited to the specific innovation knowledge.
D.1h Clients (from 1: not important to 5: very important)

To measure KEfromIK a value from 1 to 5 was attributed (1= not important to 5= very important).
The normalized indicator $I_{aq}$ takes the value 1 if the contact and the exchange of information are important, 0 otherwise.

To measure the KEfromIK indicator we have used a composite indicator calculated as the average value of the 8 normalized variables from D.1a to D.1h.

**KE from MK** consists of the source information connected to market knowledge. The last one consists of keeping information on consumers’ preferences, on the new national and international markets, on the latest trends in colors and materials.

To measure KEfromMK in a district we use the source information connected to the second part of the third level of questionnaire. The group of answers is different from the previous one because in this case the questions are referred to the MK.

D.2a Trade Fairs (from 1: not important to 5: very important)
D.2b Specialized magazines (from 1: not important to 5: very important)
D.2c National and International market (from 1: not important to 5: very important)
D.2d Formal or informal contacts with other IT firms in same sector (from 1: not important to 5: very important)
D.2e Formal or informal contacts with other foreign firms in same sector (from 1: not important to 5: very important)
D.2f Contact with commercial agents in IT and abroad (from 1: not important to 5: very important)
D.2g Suppliers (from 1: not important to 5: very important). In this case we consider the exchange of knowledge limited to the specific market knowledge.
D.2h Clients (from 1: not important to 5: very important)

To measure KEfromMK a value from 1 to 5 was attributed.
The normalized indicator $I_{a_j}$ takes the value 1 if the contact and the exchange of information are important, 0 otherwise.

To measure the KEfromMK indicator we have used a composite indicator calculated using the average value of the 8 normalized variables from D.2a to D.2h.

**E. INSTITUTIONAL NETWORK (IN)**

Taking into account the theoretical framework (Amin and Cohender, 2004; Metcalfe and Ramlogan, 2005; Lam, 2005; Foray, 2006; Camuffo and Grandinetti, 2006), local institutions create the structure of cooperative and competitive relationships in a district.

For institutional networks we mean the relationships and the synergy created between productive activities and institutions, where this term means the local authorities, chambers of commerce, trade associations and participation in important exhibitions. The work with institutions, associations, consortia, in addition to the participation in trade shows and industry is a source of information, and exchange of tacit and codified knowledge is very important. Due to the specialization required for production, training courses for workers can be organized and services offered to local businesses, creating the synergies needed to support a district. One can, in fact, make use of local institutions to cooperate (Becattini, 1989) and the observed connection among the political system, social training and economic organization are key elements in the district-based studies (Bagnasco, 1977; Trigilia, 1999).

To measure institutional networks in a district we use the source information/knowledge connected to:

**E.1 National and international fair participation** (It means contacts with institutions during the fair or the firm participation is organized by institution)

From 1=not important to 5=very important

**E.2 Relationship between firm and institutions**

From 1=not important to 5=very important

**E.3 The importance of conference participation**

From 1=not important to 5=very important

**E.4 The importance of association** From 1=not important to 5=very important

This information is in one part of the third level of questionnaire.

To measure the IN a value from 1 to 5 was attributed.

The normalized indicator $I_{a_j}$ takes the value 1 if the contact and the exchange of information are important, 0 otherwise.
To measure the IN indicator we have used a composite indicator calculated using the average value of the 4 normalized variables.

**F. INNOVATION CAPABILITIES (IC)**

Taking into consideration the theoretical part of this work, the innovation capability measure involves the introduction of new goods and/or new production process to create a new organization or a new trade (Schumpeter, 1971, 1977). For Tushman and O’Reilly (1997), it refers to the introduction of change in organizations from a strategic perspective and can relate to the changing of management practices or general structures. Innovation is something new - a new product, process, type of contract, means of distribution, marketing slogan, corporate identity (Hauschildt, 1997) or new individual way of working (Tether et al., 2005).

The relationship between knowledge and innovation is fundamental inasmuch as the former feeds the latter and it is then fed in its turn. It represents a decisive factor in the survival of businesses in a global market for the creation of continuous competitive advantage, and provides a basis for their performance. Innovation can be considered as the eventual outcome of the processes of knowledge creation, knowledge being the output of innovative activities and the main input to the knowledge production function. At the same time, a growth in knowledge is increased by technological change. Market competition and changes in consumption work together to reduce some of the traditional elements of geographical localization. Consequently, elements of proximity and competition, such as a geographical dispersion, have to be combined with spatial concentration (Guerrieri and Pietrobelli, 2004, 2006), making it necessary for businesses to create knowledge through local and external networks. This makes international knowledge and the firm organization increasingly important for the performance and evolution of an industrial district. The role of Social Capabilities is fundamental at this point in the transfer and diffusion of tacit knowledge and in the creation of new knowledge and innovation.

The relationship between knowledge and innovation involve large enterprises such as small and medium-sized businesses, where innovation is not only an investment in research and development and in the adoption of new technologies, but it consists also of the gradual change of types of product, changes in consumer tastes, implementing of new organizational methods, both internally and in their relationship with other companies, customers and suppliers (Cappellin, 2010) as well as of creating new types of contract, means of distribution, new individual ways of working (Tether et al. 2005), and design innovation.

To measure Innovation Capabilities in a district we use:

**F.1 Researchers number/Employees number in 2011 and full time**
F.2 Investment in R&D and design in 2011 and in Euros

F.3 CAD (Computer-Aided Design) or CAM (Computer-Aided Manufacturing) use. (1 if yes; 0 if no)

F.4 Process experiment number (prototype) from 0 to 10

F.5 Product experiment number (prototype) from 0 to 10

F.6 Expenditure in learning in 2011 and in Euros

F.7 Expenditure in skills in 2011 and in Euros

F.8 Introduction of new products in 2011 (1 if yes, 0 if no)

F.9 Introduction of new processes in 2011 (1 if yes, 0 if no)

F.10 Introduction of new organizational methods in 2011 (1 if yes, 0 if no)

F.11 Introduction of demand-driven innovation in 2011 (1 if yes, 0 if no)

F.12 Design activities performed in house or with other firms in 2011 (1 if yes, 0 if no)

The source of information is in the second part of questionnaire.

The normalized indicator $I_{qf}$ takes the value 1 if the firm has a good performance, 0 otherwise.

To measure the IC indicator we have used a composite indicator calculated using the average value of the 12 normalized variables.

G. MARKET CAPABILITIES (MC)

Market capabilities try to create and to move into new market segments, to use new slogans for old or new products (Utterback and Abernathy, 1975; 1978; Cappellin, 2010).

To catch the Social Capabilities, marketing capabilities are important, they consist of using new slogans, the web and so on.

To measure market capabilities in a district we use:

G.1 Marketing expenditure in 2011 and in Euros

G.2 The web use (1 if yes, 0 if no)

G.3 Marketing with the web (1= if yes, 0= if no)

G.4 Ability to move into new market segments or new country areas (1= if yes, 0= if no)

G.5 Information scanning abilities for market knowledge with Specialized magazines (from 1=not important to 5=very important)

G.6 Information scanning abilities for market knowledge with National and international market (from 1=not important to 5=very important)

G.7 Trade relations (from 1=not important to 5=very important)

---

69 See at this regard footnote 48
G.8 Trade Fairs participation (from 1=not important to 5=very important). In this case the fairs participation is important to consider the marketing strategy used by the competitors.

G.9 Market knowledge (1 if yes, 0 if no)

The source of information is in the second part of questionnaire

The normalized indicator $I_{qf}$ takes the value 1 if the firm has a good performance, 0 otherwise.

To measure the MC indicator we have used the composite indicator calculated using the average value of the 9 normalized variables.

After we calculate the mean of the 8 composite indicators to obtain the Social Capabilities for each firm and we use the linear aggregation (1) as we have highlighted before.

8.4 Measuring Social Capabilities in the Wedding District

In this section we present the Social Capabilities results for the wedding industrial district.

To measure Social Capabilities in the wedding district, we have taken into consideration all the firms that responded to the questionnaire (30 firms) and the methodology is described in the previous section (8.3). The results of each indicator and of the Social Capabilities presented in Table 21 range from 0 to 1, taking the value “1” if a firm has a good performance and otherwise “0”. The descriptive statistics is presented in Table 22. The SC indicator in this district is on average equal to 0.44 and it has a low standard deviation such as the other indicators. Comparing the two tables 21 and 22 we remark that the min SC value is 0.13 represented by the firm P; the max SC value is 0.85 represented by the firm M. The SC index is very low in the firm P because the firm does not contribute to the creation and diffusion of tacit knowledge in the district and it does not have a good competitive advantage. In this firm the relationship among workers is absent because it is without employees and consequently the expenditure on learning and skills is absent. Expenditure on R&D is also absent and it does not use CAD or CAM. The IC indicator in fact presents the min value and it is equal to 0.08. The networks with the other firms are absent (IN value is equal to 0.00), such as the source of information connected to the market knowledge (KE from MK is 0.00) and to the innovation knowledge (KE from IK is 0.02). It has only relations with the association (IN is 0.06) and its participation to the trade fairs is good since it forms its source of information and knowledge acquisition. The firm catches the information through specialized magazines to know the market (MC is 0.11). In other words, it is an island in a sea of market relations despite the
spatial proximity to the district is good (GS is 0.50). In this case the spatial proximity to the district influences only social interactions (SN is 0.25) and knowledge sharing through this channel. On the other side, the firm with the better SC is the “M” in the core of the district (GS is 1.00). In this case, the firm has a good capability to use the spatial proximity to enlarge knowledge learning process and diffuse it in the district and at the same time the external relations are very important. In fact this firm is very dynamic; it has a good performance even if it is small in size (10-19 employees). The firm networks at local, national and international level is very important (FN is 1.00) rather than the social networks (SN is 0.33). For example a common space in the firm to exchange knowledge or ideas is absent as well as the formal or informal meetings are limited, instead the relationships with the suppliers and customers are very important. The relationship with institutions is very important (IN is 1.00) as well as the knowledge exchange connected to the innovation knowledge and market knowledge. The innovation capabilities are important (0.58) but it does not have the max value (0.67) because it has few researchers in R&D and the expenditure in skills and learning is low. But the use of CAD or CAM and the process and product experiments are very high as well as the introduction of new product, processes and new organization methods.

The IC value is max for the firm “Q” because the expenditure in R&D and design is important as well as the expenditure in skills and learning. This firm uses CAD or CAM, the process and product experiments are high as well as the introduction of new products, processes and new organization methods. This firm is in the centre of the district and of the social networks has the max value (0.81) because it has common space in the firm and the formal and informal meetings are numerous in one month.
Table 21 – The measure of Social Capabilities in the wedding district

<table>
<thead>
<tr>
<th>FIRM/Indicators</th>
<th>IC</th>
<th>MC</th>
<th>GS</th>
<th>FN</th>
<th>SN</th>
<th>IN</th>
<th>KE FROM</th>
<th>KE FROM</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.55</td>
<td>0.68</td>
<td>0.50</td>
<td>0.56</td>
<td>0.00</td>
<td>0.25</td>
<td>0.45</td>
<td>0.48</td>
<td>0.43</td>
</tr>
<tr>
<td>B</td>
<td>0.57</td>
<td>0.87</td>
<td>0.81</td>
<td>0.75</td>
<td>0.25</td>
<td>0.5</td>
<td>0.61</td>
<td>0.66</td>
<td>0.63</td>
</tr>
<tr>
<td>C</td>
<td>0.50</td>
<td>0.56</td>
<td>0.50</td>
<td>0.25</td>
<td>0.15</td>
<td>0.38</td>
<td>0.36</td>
<td>0.36</td>
<td>0.38</td>
</tr>
<tr>
<td>D</td>
<td>0.31</td>
<td>0.50</td>
<td>1.00</td>
<td>0.25</td>
<td>0.27</td>
<td>0.25</td>
<td>0.23</td>
<td>0.23</td>
<td>0.38</td>
</tr>
<tr>
<td>E</td>
<td>0.24</td>
<td>0.76</td>
<td>0.50</td>
<td>0.63</td>
<td>0.22</td>
<td>0.69</td>
<td>0.73</td>
<td>0.80</td>
<td>0.57</td>
</tr>
<tr>
<td>F</td>
<td>0.67</td>
<td>0.81</td>
<td>0.23</td>
<td>0.88</td>
<td>0.38</td>
<td>0.50</td>
<td>0.75</td>
<td>0.48</td>
<td>0.59</td>
</tr>
<tr>
<td>G</td>
<td>0.46</td>
<td>0.58</td>
<td>0.50</td>
<td>0.56</td>
<td>0.24</td>
<td>0.25</td>
<td>0.41</td>
<td>0.36</td>
<td>0.42</td>
</tr>
<tr>
<td>H</td>
<td>0.42</td>
<td>0.69</td>
<td>0.50</td>
<td>0.44</td>
<td>0.31</td>
<td>0.25</td>
<td>0.39</td>
<td>0.61</td>
<td>0.45</td>
</tr>
<tr>
<td>I</td>
<td>0.08</td>
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<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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</tr>
<tr>
<td>L</td>
<td>0.23</td>
<td>0.22</td>
<td>0.50</td>
<td>0.25</td>
<td>0.15</td>
<td>0.43</td>
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</tr>
<tr>
<td>M</td>
<td>0.58</td>
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<td>1.00</td>
<td>1.00</td>
<td>0.33</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.85</td>
</tr>
<tr>
<td>N</td>
<td>0.33</td>
<td>0.72</td>
<td>1.00</td>
<td>1.00</td>
<td>0.17</td>
<td>0.75</td>
<td>1.00</td>
<td>0.75</td>
<td>0.72</td>
</tr>
<tr>
<td>O</td>
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<td>1.00</td>
<td>0.38</td>
<td>0.15</td>
<td>0.25</td>
<td>0.27</td>
<td>0.43</td>
<td>0.46</td>
</tr>
<tr>
<td>P</td>
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<td>0.11</td>
<td>0.50</td>
<td>0.00</td>
<td>0.25</td>
<td>0.06</td>
<td>0.02</td>
<td>0.00</td>
<td>0.13</td>
</tr>
<tr>
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<td>0.63</td>
<td>0.81</td>
<td>0.56</td>
<td>0.64</td>
<td>0.66</td>
<td>0.74</td>
</tr>
<tr>
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<td>0.64</td>
<td>1.00</td>
<td>0.38</td>
<td>0.26</td>
<td>0.00</td>
<td>0.48</td>
<td>0.48</td>
<td>0.45</td>
</tr>
<tr>
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<td>0.74</td>
<td>0.56</td>
<td>0.19</td>
<td>0.56</td>
<td>0.61</td>
<td>0.64</td>
<td>0.57</td>
</tr>
<tr>
<td>T</td>
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<td>0.38</td>
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<td>0.25</td>
<td>0.34</td>
<td>0.48</td>
<td>0.45</td>
</tr>
<tr>
<td>U</td>
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<td>1.00</td>
<td>0.88</td>
<td>0.17</td>
<td>0.25</td>
<td>0.68</td>
<td>0.73</td>
<td>0.67</td>
</tr>
<tr>
<td>V</td>
<td>0.43</td>
<td>0.69</td>
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<td>0.00</td>
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<td>0.00</td>
<td>0.14</td>
<td>0.14</td>
<td>0.32</td>
</tr>
<tr>
<td>W</td>
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<td>0.14</td>
<td>0.50</td>
<td>0.13</td>
<td>0.12</td>
<td>0.00</td>
<td>0.16</td>
<td>0.05</td>
<td>0.17</td>
</tr>
<tr>
<td>X</td>
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<td>0.23</td>
<td>0.50</td>
<td>0.19</td>
<td>0.23</td>
<td>0.25</td>
<td>0.14</td>
<td>0.14</td>
<td>0.23</td>
</tr>
<tr>
<td>Y</td>
<td>0.31</td>
<td>0.72</td>
<td>0.68</td>
<td>0.62</td>
<td>0.24</td>
<td>0.62</td>
<td>0.59</td>
<td>0.66</td>
<td>0.56</td>
</tr>
<tr>
<td>Z</td>
<td>0.42</td>
<td>0.22</td>
<td>0.50</td>
<td>0.00</td>
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<td>0.25</td>
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<td>0.11</td>
<td>0.21</td>
</tr>
<tr>
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<td>0.54</td>
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<td>1.00</td>
<td>0.88</td>
<td>0.56</td>
<td>0.63</td>
<td>0.73</td>
<td>0.66</td>
<td>0.71</td>
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<td>AB</td>
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<td>0.74</td>
<td>0.00</td>
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<td>0.25</td>
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<td>0.16</td>
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<tr>
<td>AC</td>
<td>0.48</td>
<td>0.72</td>
<td>1.00</td>
<td>0.38</td>
<td>0.18</td>
<td>0.25</td>
<td>0.25</td>
<td>0.43</td>
<td>0.46</td>
</tr>
<tr>
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<td>0.53</td>
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<td>0.27</td>
<td>0.25</td>
<td>0.00</td>
<td>0.39</td>
<td>0.19</td>
</tr>
<tr>
<td>AE</td>
<td>0.38</td>
<td>0.20</td>
<td>0.50</td>
<td>0.56</td>
<td>0.20</td>
<td>0.81</td>
<td>0.66</td>
<td>0.00</td>
<td>0.41</td>
</tr>
<tr>
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<td>0.25</td>
<td>0.50</td>
<td>0.44</td>
<td>0.23</td>
<td>0.50</td>
<td>0.48</td>
<td>0.00</td>
<td>0.34</td>
</tr>
</tbody>
</table>

The distribution of indicators is in Appendix D

Table 22 – Descriptive statistics in the wedding clothing district

<table>
<thead>
<tr>
<th>Indicators</th>
<th>N. Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>30</td>
<td>0.440</td>
<td>0.191</td>
<td>0.13</td>
<td>0.85</td>
</tr>
<tr>
<td>IC</td>
<td>30</td>
<td>0.393</td>
<td>0.173</td>
<td>0.08</td>
<td>0.67</td>
</tr>
<tr>
<td>MC</td>
<td>30</td>
<td>0.565</td>
<td>0.269</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>GS</td>
<td>30</td>
<td>0.706</td>
<td>0.280</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>FN</td>
<td>30</td>
<td>0.432</td>
<td>0.316</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SN</td>
<td>30</td>
<td>0.233</td>
<td>0.152</td>
<td>0</td>
<td>0.81</td>
</tr>
<tr>
<td>IN</td>
<td>30</td>
<td>0.366</td>
<td>0.256</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>KEfromIK</td>
<td>30</td>
<td>0.417</td>
<td>0.284</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>KEfromMK</td>
<td>30</td>
<td>0.407</td>
<td>0.276</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

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As one can see from Table 23, the composite indicators IC, MC, FN, IN KEfromIK, and KEfromMK are highly positively correlated with the Social Capabilities. The high coefficient of IC can be explained for the importance of the different forms of innovations used in the small- and medium-sized firms and particularly for the importance of new production innovation, the CAD and CAM use and web use. The indicators GN and SN are less significant but in any case positive since, from an analysis of the results, as we have highlighted in Chapters 4 and 7, the industrial district does not seem to have all the characteristics of the traditional industrial district. It is much more a modern industrial district. The firms in fact are not characterized by concentration, but aggregation under the terms of the Regional government resolution. The GS indicator presents the lowest coefficients of correlation even if positive with the IC and MC, because the spatial aggregation does not facilitate the innovation and the marketing capabilities. SN is less correlated because in dealing mostly with small or very small firms, and in spite of the presence of shared spaces, the meetings are mostly informal and the figure of the manager coincides with that of the owner. It should be added that knowledge is transmitted only within the same firm, while with their competitors the exchange of information on upstream or downstream phases of the process is limited. The correlation between SN and GS is in fact very low. It also means that the local face to face interaction is not very important and it unstimulated by the spatial proximity.

MC and KEfromMK are highly correlated inasmuch as the firm conducts careful marketing policies, facilitating the exchange of information and knowledge via well-constructed websites. But the firms do not relocate their production activities abroad in order to maintain the high quality of the product, but they limit their activity to the marketing, through the signing of contracts with agents, importers and distributors. But this modality action does not imply a knowledge exchange connected to market knowledge among industrial firms. It is for this reason that KEfromIK has a low correlation with GS. The IN indicator has a high correlation with the SC and with FN indicator because of the national and international fair participation, because of the association membership and because of the synergy between firms and institutions, even if, in general, the institutions do not play an important role in this sector.

Table 23 - Correlation amongst SC and IC, MC, GS, FN, SN, IN, KEfromIK, KEfromMK in the wedding industrial district

<table>
<thead>
<tr>
<th></th>
<th>SC</th>
<th>IC</th>
<th>MC</th>
<th>GS</th>
<th>FN</th>
<th>SN</th>
<th>IN</th>
<th>KEfromIK</th>
<th>KEfromMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>0.732</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>0.843</td>
<td>0.733</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GS</td>
<td>0.443</td>
<td>0.324</td>
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<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN</td>
<td>0.923</td>
<td>0.646</td>
<td>0.685</td>
<td>0.247</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.492</td>
<td>0.343</td>
<td>0.398</td>
<td>0.101</td>
<td>0.354</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>0.716</td>
<td>0.341</td>
<td>0.386</td>
<td>0.011</td>
<td>0.734</td>
<td>0.373</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEfromIK</td>
<td>0.914</td>
<td>0.586</td>
<td>0.645</td>
<td>0.237</td>
<td>0.959</td>
<td>0.359</td>
<td>0.811</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>KEfromMK</td>
<td>0.878</td>
<td>0.552</td>
<td>0.862</td>
<td>0.292</td>
<td>0.779</td>
<td>0.346</td>
<td>0.571</td>
<td>0.753</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Based on the Social Capabilities results presented in Table 21, we study the Social Capabilities diffusion in the wedding district (Figure 37) and we divide the firms belonging to the district into four groups:

- The **SC leader** group scores more than 0.70. 13.3% of the firms belonging to the district can be considered leaders for the high spread of SC within the group and within the district. These are the firms in the sample that have a class size from small to medium. Only one (‘Q’) has more than 40 employees (Fig.38) while another (‘M’) has the most extensive relationships with its suppliers (Fig.39).

- The **SC follower** group, scoring more than 0.50, accounts for almost the entire district. 20% of the firms belonging to the district can be considered followers for the high incidence of SC within them and within the district. As it can be seen by observing Figures 38 up to 41, they belong to a range of different dimensional classes, two in fact having no permanent staff at all but only seasonal workers.

- The **Moderate SC** group scores more than 0.30. 40% of the firms belonging to the district can be considered moderate for the modest diffusion of SC within them and within the district. As it can be seen by observing Figures 38 up to 41, they belong to a range of different dimensional classes.

- The **Modest SC** group does not exceed a score of 0.30. 26.7% of the firms belonging to the district can be considered modest for the low uptake of the SC within them and within the district. In contrast to the findings above, this group includes only firms without permanent employees or firms that are very small in size (Figs. 40 and 41).
The predominant group is therefore made up of moderate businesses (40%), the group of firms that contributes to the dissemination of high to very high SC within the district, equal to 33.3% (Group 1 and Group 2), is also very high.

We consider it important to think about the relationship between the SC and the firm size, measured with the number of full time employees and about the descriptive statistics presented in Table 24, because the firm “Q”, “M” and “AA” are larger in size considering the sector and have high level of SC. As we have remarked in Chapter 7, considering the classification of the firms, only 10% of the firms have 20-49 full time employees. As we can see from the descriptive statistics, the value max of employees is 40. The firms, in question, in fact, have more performance and they are more dynamic according to the Schumpeterian theory, even if as we have highlighted in the theoretical part of this work (Chapter 2), others types of innovation regarding the SME exist.

It follows that within the district the diffusion of SC is high, but it is poorly related to the size of the enterprise. The average of the employees observed is in fact 7.2, micro in size.
Figure 38 - Relationship between SC and size - in the firms of the wedding district with 20-49 employees

Figure 39 - Relationship between SC and size - in the firms of the wedding district with 10-19 employees

Figure 40 – Relationship between SC and size - in the firms of the wedding district without employees
In this section we present the Social Capabilities results for the baby clothing district. To measure Social Capabilities in the baby clothing district, we have taken into consideration all the firms that responded to the questionnaire (42 firms), the methodology being described in a previous section (8.3). The results presented in Table 25 range from 0 to 1, taking the value “1” if a firm has a good performance and otherwise “0”. The descriptive statistics is presented in Table 26. The SC indicator in the baby clothing district is on average equal to 0.59 and higher than that of the wedding dress district which is equal to 0.44, as it is the case for the other indicators. All indicators have a low standard deviation. We note, instead, that the max SC value for the baby clothing district is 0.79 - lower than the max value of the wedding dress district - and the min value is 0.31 – higher than the max value of the wedding dress district. Comparing the two tables, we note that the firm “AB”, even if small in size, presents the max SC value and the firm “AA” micro in size, presents the min SC value. The firm “AB” is in the core of the district (GS is 1.00) and it produces both independently and for third parties. For this reason, the firm networks, equal to 1.00, are a very important channel for knowledge acquisition and diffusion for the firm itself and to spread it within the district. The firm “AB” cooperates in fact with the other firms of the district because it works
for third parties. Consequently the social networks are important, too, with a value equal to 0.81 because of the existence of a common space in the firm to exchange knowledge and new ideas. The relationship with the suppliers are important as well as the informal meetings that prevail on the formal ones. The relationship with the institution are also important (IN is equal to 0.71) and particularly with the consortium. On the contrary the IC and the MC are not very high and equal respectively to 0.46 and 0.50 because the firm in question does not invest in R&D, design, marketing. The max values of these values are instead respectively of 0.88 and 1. The design activities carried out with other firms performed with CAD or CAM use is very important for the firm “AB” as well as the source of information connected to the innovation knowledge and to the market knowledge equal to 0.90.

The firm that presents the lowest SC index of diffusion is the “AA” even if it is near the core of the district (GS is 0.93), but it is isolated despite the spatial proximity to the district, because the social and firm networks are absent (FN and SN are equal to 0.00) and the institutional networks are few (the IN value is 0.25) with the only consortia. While investing modestly in R&D and in design and while using the CAD or CAM to introduce new product, the IC value is modest (0.37) because any innovation of process and process experiments are excluded. The market capabilities presents the min value (0.13) because the firm does not use the web, the expenditure in marketing is very low and utilized only to participate in the local fairs. The source of information connected to the market knowledge and innovation knowledge is equal to 0.43 because of their relations with suppliers, clients and during the trade fairs.
### Table 25 – The measure of Social Capabilities in the baby clothing district

<table>
<thead>
<tr>
<th>Firm/Indicator</th>
<th>IC</th>
<th>MC</th>
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<th>FN</th>
<th>SN</th>
<th>IN</th>
<th>KE FROM</th>
<th>KE FROM</th>
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*The distribution of indicators is in Appendix D*
As one can see from Table 27, the composite indicators MC, FN, IN, KEfromIK, and KEfromMK are highly positively correlated with the Social Capabilities. MC and KEfromMK are highly correlated as the firms follow careful marketing policies, facilitating the exchange of information and knowledge via well-constructed websites. To this the attention given to the profile on national and international markets should be added; it comes not only from relying on commercial agents, but also from relocating manufacturing operations abroad or entering into sub-contracts and licenses. The IN indicator is high because the institutions and consortia play an important role in this sector, as well as formal and informal contacts with other local, national and international companies represented by the indicators FN and KEfromIK. The indicators IC, GS and SN are less significant but in any case positive with the SC. The coefficient of IC is not highly correlated probably because, although relevant, only 10% of the R&D activity is performed with other firms. The indicators GS and SN are less significant but in any case positive because this district does not seem to have the characteristics of the cases identified in the literature. Instead the GS shows a negative correlation with IC and MC because the innovation and the marketing leverage the existing one and thus the environment is an external data from which firms derive their inputs. Consequently SN and FN are also negative correlated with the GS because the territorial proximity does not stimulate – with some exception – the interactions among the economic agents. In other words, as we have evidenced in the theoretical part (Chapter 4) this district has become global and the source of external information or knowledge is more important. SN is less correlated because the number of meetings is modest and they are mainly informal. Moreover the role of manager often coincides with that of the owner, even when the firms are largely medium-sized.

| Table 26 – Descriptive statistics in the baby clothing district |
|------------------|-------|-------|-------|-------|-------|
| Indicators       | N.Obs.| Mean  | Std. Dev. | Min | Max |
| IC               | 42    | 0.544 | 0.124     | 0.3 | 0.88 |
| MC               | 42    | 0.694 | 0.207     | 0.13 | 1   |
| GS               | 42    | 0.799 | 0.251     | 0   | 1   |
| FN               | 42    | 0.671 | 0.220     | 0   | 1   |
| SN               | 42    | 0.399 | 0.229     | 0   | 0.96 |
| IN               | 42    | 0.418 | 0.173     | 0.16 | 0.75 |
| KEfromIK         | 42    | 0.592 | 0.128     | 0.3 | 0.90 |
| KEfromMK         | 42    | 0.597 | 0.148     | 0.23 | 1   |
| SC               | 42    | 0.590 | 0.100     | 0.31 | 0.79 |
Table 27: Correlation amongst SC and IC, MC, GS, FN, SN, IN, KEfromIK, KEfromMK in the baby clothing district

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<th></th>
<th>SC</th>
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<th>FN</th>
<th>SN</th>
<th>IN</th>
<th>KEfromIK</th>
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Based on the Social Capabilities results presented in Table 25, we study the Social Capabilities diffusion in the baby clothing district (Figure 42) and unlike the wedding dresses district; we divide the firms belonging to the district into three groups:

- **The SC leader** group scores more than 0.70. 9.5% of the firms belonging to the district can be considered leaders for the high spread of SC within the group and within the district. These are the firms in the sample that have a small class size such as ‘AB’, which has only 10 employees (Fig. 43), but that, in addition to produce for its own, is also an outside contractor for the district, tough it is too large for the sector in question. One (‘Z’) has more than 120 employees (Fig. 44).

- **The SC follower** group, scoring more than 0.50, accounts for almost the entire district. 73.8% of the firm belonging to the district can be considered followers for the high incidence of SC within them and within the district. As it can be seen by observing Figures 43 up to 46, they belong to a range of different dimensional classes.

- **The Moderate SC group** scores more than 0.30. 16.7% of the firms belonging to the district can be considered moderate for the modest diffusion of SC within them and within the district and belong to the micro and small class sizes.

- **The Modest SC group**, not scoring more than 0.30, does not exist.
The predominant group is therefore made up of the follower enterprises (73.8%), while the group of firms that contributes to the high spread of SC within the district, 9.5% of the total (Group 1), is small. It follows that within the district the spread of the SC is very high, but this is poorly correlated to the size of enterprise, measured by the number of full time employees. Considering the descriptive statistics (Table 28), the average of the full time employees is 34.9. In other words, as we have remarked in Chapter 7, even if the 42% of the firms are from small to medium sized considering the particular sector, and the SC index is high, this does not mean that the firms with higher performance are those that have a higher size.
**Figure 43** - Relationship between SC and size - in the firms of the baby clothing district with 10-19 employees

![Graph](image)

**Figure 44** - Relationship between SC and size - in the firms of the baby clothing district with 50-250 employees

![Graph](image)

**Figure 45** - Relationship between SC and size - in the firms of the baby clothing district with 1-9 employees

![Graph](image)
Table 28 - Descriptive statistics of the SC and of the number of full time employees in the baby clothing district

<table>
<thead>
<tr>
<th>Variable</th>
<th>N. Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>42</td>
<td>0.59</td>
<td>0.100</td>
<td>0.31</td>
<td>0.79</td>
</tr>
<tr>
<td>Employees</td>
<td>42</td>
<td>34.92</td>
<td>34.44</td>
<td>3</td>
<td>150</td>
</tr>
</tbody>
</table>

Furthermore, considering the academic classification as highlighted in Chapter 5, and the activity of the sample firms with a diversified production to take advantage of economies of scope, we have divided this section of baby clothing activity into 4 groups (Table 29). We want to catch, in fact, the importance of the clothing production process and the Social Capabilities.

We have distinguish four group and not three group such as in Chapter 5, because the empirical results has evidenced that in the baby clothing district does not exist firms that produces only ceremonial for babies. For this reason we have adapt the theoretical classification to the empirical results.
Table 29 Academic Classification and baby clothing activity

<table>
<thead>
<tr>
<th>Categories</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ceremonial:</td>
<td>dresses for ceremony, pullover</td>
</tr>
<tr>
<td>(Classic/traditional/fashion)</td>
<td></td>
</tr>
<tr>
<td>2 External clothing:</td>
<td>sportswear, outerwear, ceremonial</td>
</tr>
<tr>
<td>(Innovative/traditional/fashion)</td>
<td></td>
</tr>
<tr>
<td>3 Knitwear goods</td>
<td>cotton pullover, woollen pullover, cashmere pullover</td>
</tr>
<tr>
<td>(Traditional/fashion)</td>
<td></td>
</tr>
<tr>
<td>4 External clothing:</td>
<td>jackets, padded jacket, overcoat</td>
</tr>
<tr>
<td>(Innovative)</td>
<td></td>
</tr>
</tbody>
</table>

1. Ceremonial Group which includes firms with Ceremonial and pullover activity in the Baby Clothing district. This activity can be considered classic/traditional/fashion because the innovation is low, the R&D and Design are developed in house, it is a labour-intensity process and the workers have high and specific skills. But at the same time the firms pay attention to the marketing. 33.3% of the sample firms belong to this group and the SC is, on average, equal to 0.59.

2. The External Clothing Group which includes firms that produce sportswear, outerwear and ceremonial clothing in the Baby Clothing district. This activity can be considered Innovative/traditional/fashion because the innovation is important but the process is fashion-intensive. 42.9% of the sample firms belong to this group and the SC is, on average, equal to 0.60.

3. The Knitwear Goods Group that includes firms that produce pullovers and cardigans in the Baby Clothing district. This activity can be considered traditional/fashion because it is very important and marketing-driven, with investment in design, the process is fashion-intensive, medium-skill white collar prevails as regards the study of design and fashion and we include the knit goods. Only 9.5% of the sample firms belong to this group, but the SC is on average equal to 0.63.

4. The External Clothing Group includes firms specializing in the production of outerwear and sportswear. This activity is innovative. The R&D and Design is performed in house and with external companies, it is a technology-intensity process, the workers have high and generic skills. 11.9% of the enterprises belong to this group and despite being the most innovative firms, the SC is, on average, equal to 0.52.
8.6 Measuring Social Capabilities in the Special Clothing District

In this section we present the Social Capabilities results for the Special clothing district composed as we have seen in Chapter 7, of the wedding and baby clothing results.

To measure Social Capabilities in the Special clothing district, we use the results presented in Tables 21 and 25. The descriptive statistics are presented in Table 30.

As one can see from Table 30, the Social Capabilities indicator in the Special district presents a mean of 0.52 – it means that the enlarged knowledge learning process and diffusion is good - with a max value of 0.85 and a min value of 0.13. These values are related to the wedding business just examined in the section 8.4. The spatial proximity of the district presents the higher value of 0.76. It means that firm agglomeration exists as well as good firm networks (FN is 0.57). The firms have capabilities for entering into a new market segments or new country areas, a good ability to use the web and to participate in trade fairs (MC mean is 0.64).

The district innovation capabilities has as an average a lower value (0.48) than the market capabilities (MC is 0.64), but it is important in any case, because as we have highlighted in Chapter 7, the investment in R&D and design, in skills and learning are not high. But we must consider the period during which the questionnaire was administered too. On the contrary, the CAM or CAD use, the product and process experiments, the introduction of new products and new processes and the introduction of innovation directed by demand are important. The social networks, instead, as an average are 0.33 because the competitive prevails rather than cooperative attitude at the individual level. Instead the knowledge creation and diffusion derived from market knowledge and from innovation knowledge is good (the values are respectively of 0.51 and 0.52 as an average).

Table 30 - Descriptive statistics in the Special industrial district

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>72</td>
<td>0.481</td>
<td>0.164</td>
<td>0.08</td>
<td>0.88</td>
</tr>
<tr>
<td>MC</td>
<td>72</td>
<td>0.640</td>
<td>0.242</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>GS</td>
<td>72</td>
<td>0.760</td>
<td>0.266</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>FN</td>
<td>72</td>
<td>0.571</td>
<td>0.288</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SN</td>
<td>72</td>
<td>0.330</td>
<td>0.216</td>
<td>0</td>
<td>0.96</td>
</tr>
<tr>
<td>IN</td>
<td>72</td>
<td>0.396</td>
<td>0.212</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>KEfromIK</td>
<td>72</td>
<td>0.519</td>
<td>0.224</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>KEfromMK</td>
<td>72</td>
<td>0.518</td>
<td>0.230</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SC</td>
<td>72</td>
<td>0.527</td>
<td>0.162</td>
<td>0.13</td>
<td>0.85</td>
</tr>
</tbody>
</table>

As it can be seen from Table 31, the composite indicator SC is highly positively correlated with Innovation Capabilities (IC), Marketing Capabilities (MC), Firm Networks (FN), Institutional
Networks (IN), Knowledge Exchange connected to Innovation Knowledge (KEfromIK), and Knowledge Exchange connected to Market Knowledge (KEfromMK).

Table 31 - Correlation among SC and IC, MC, GS, FN, SN, IN, KEfromIK, KEfromMK in the Special industrial district

<table>
<thead>
<tr>
<th></th>
<th>SC</th>
<th>IC</th>
<th>MC</th>
<th>GS</th>
<th>FN</th>
<th>SN</th>
<th>IN</th>
<th>KEfromIK</th>
<th>KEfromMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>0.689</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>0.744</td>
<td>0.665</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GS</td>
<td>0.366</td>
<td>0.207</td>
<td>0.070</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN</td>
<td>0.866</td>
<td>0.499</td>
<td>0.518</td>
<td>0.187</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.502</td>
<td>0.298</td>
<td>0.419</td>
<td>-0.112</td>
<td>0.379</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>0.676</td>
<td>0.390</td>
<td>0.440</td>
<td>0.062</td>
<td>0.504</td>
<td>0.241</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEfromIK</td>
<td>0.900</td>
<td>0.502</td>
<td>0.516</td>
<td>0.237</td>
<td>0.911</td>
<td>0.334</td>
<td>0.691</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>KEfromMK</td>
<td>0.874</td>
<td>0.487</td>
<td>0.627</td>
<td>0.260</td>
<td>0.790</td>
<td>0.337</td>
<td>0.547</td>
<td>0.825</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The high coefficient of IC can be explained by the importance of different forms of innovation used in the small and medium-sized firms. The indicators, Geographical Space (GS) and Social Networks (SN), are less significant but in any case positive. In fact the GS indicator presents the lowest coefficients of correlation even though they are positive with the only exception of SN indicator and differently from what we have verified for the baby industrial district (Table 27). In the baby district case, in fact, GS showed a negative correlation with IC, MC, FN and SN. In the wedding industrial district, instead, all the indicators GS, FN, SN, IC and MC are positive (see Table 23). We can explain these different correlations because the special industrial district is composed of a larger number of firms. In other words, it is characterized by a greater aggregation of firms and consequently this greater spatial aggregation facilitates slightly the innovation capabilities and the marketing capabilities. At the same time the GS indicator shows a positive correlation with FN indicator - differently from the baby industrial district result – because of the presence of some firms that are a point of union between the two industrial districts. This presence permits the share of firm knowledge as we have remarked in Chapter 7.

SN indicator is less correlated with the SC index, but it is important because, in dealing mostly with small or very small firms and in spite of the lack of shared spaces, the meetings are mostly informal and the manager coincides with the owner. Moreover knowledge is transmitted only within the same firm, - for this reason the correlation with the GS is negative and it remains negative compared with the baby industrial district result- while the exchange of information with their competitors on the process upstream or downstream phases is limited.

Marketing Capabilities (MC) and Knowledge Exchange connected to Market Knowledge (KEfromMK) are highly correlated with the SC index as the firms apply careful marketing policies, facilitating the exchange of information and knowledge via well-constructed websites. To this the
attention paid to the profile on national and international markets should be added; it comes not only from relying on commercial agents, but also from relocating manufacturing operations abroad or entering into sub-contracts and licenses. This process of internationalization makes the district global or modern and it explains why the GS is less correlated with the other indicators. The Institutional Network (IN) indicator is high because the institutions and consortia play an important role in this sector, as well as formal and informal contacts with other local, national and international companies represented by the indicators Firm Networks (FN) and Knowledge Exchange connected to Innovation Knowledge (KEfromIK).

Based on the Social Capabilities results presented in Tables 21 and 25, we study the Social Capabilities diffusion in the Special industrial district (Figure 47). We can divide the businesses belonging to the only one industrial district into four groups:

- The **SC leader** group scores more than 0.70. 11.1% of the firms belonging to the district can be considered leaders for the high spread of SC within the firm and within the district. These are the firms in the sample that have a class size from small to medium size. Only one (‘Q’) has more than 40 employees while another (‘M’) has the most extensive relationships with its suppliers.

- The **SC follower** group, scoring more than 0.50, accounts for almost the entire district. 51.4% of the firms belonging to the district can be considered followers for the high incidence of SC within them and within the district. They belong to a range of different dimensional classes, six in fact having no permanent staff at all but only seasonal workers and four more than 100 employees.

- The **moderate** SC group scores more than 0.30. 26.4% of the firms belonging to the district can be considered moderate for the modest diffusion of SC within them and within the district. They belong to a range of micro and small dimensional classes. Only four have more than 20 employees.

- The **modest** SC group does not exceed a score of 0.30. 11.1% of the firms belonging to the district can be considered modest for the low uptake of the SC within them and within the district. This group includes only firms without permanent employees or firms that are very small in size and firms that produce only wedding dresses.
Figure 47 - SC diffusion in the Special industrial district

[Bar chart showing the diffusion of SC in different areas, with categories for Modest SC, Moderate SC, SC followers, and SC leaders.]
The predominant group is therefore made up of follower businesses (51.4%), the group of firms that contributes to the dissemination of SC within the district, equal to 26.4% (Group 3), is also high. It follows that within the district the diffusion of SC is high, but it is not related to the size of the enterprise measured by the number of full time employees. Considering the descriptive statistics (Table 32) the average of full time employees is 23.4. In other words, the SC index is high, but this does not mean that the firms with higher performance are those that have a higher size.

**Table 32-** Descriptive statistics of the SC and the number of full time employees in the Special clothing district

<table>
<thead>
<tr>
<th>Variable</th>
<th>N. Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>72</td>
<td>0.527</td>
<td>0.162</td>
<td>0.13</td>
<td>0.85</td>
</tr>
<tr>
<td>Employees</td>
<td>72</td>
<td>23.388</td>
<td>30.186</td>
<td>0</td>
<td>150</td>
</tr>
</tbody>
</table>

Considering the empirical evidence in the light of Nonaka and Takeuchi’s model (1995) and theoretical framework developed in Chapter 4, we can point out for the special industrial district that:

The **socialization** that represents one of the most important phases of Nonaka and Takeuchi’s model is high. In fact the district is the place for a high degree of tacit knowledge diffusion, Social Capabilities and knowledge transfer through interpersonal relationships and in particular external relationships, weak ties and strong ties, informal meetings, interactions with customers, suppliers, managers and designer and the observation and imitation of other directly competitive firms is high.

The **externalization** where tacit knowledge becomes explicit in the form of a new product concept is high because the figurative language, the imagination and Cad or Cam use is essential for the firms. So the new product concept is formed through socialization and externalization.

The **combination** that is the transfer of explicit to explicit knowledge and it is the process of transforming a concept into a knowledge system with documents, meetings, computer, prototypes is high in the special district and in the wedding and baby clothing districts, all of which can lead to new knowledge. It involves people interacting and combining knowledge.

The **internalization** or transformation of knowledge from explicit to tacit, that is associated with “learning by doing”, of internalizing experiences in tacit knowledge held by individuals is very important for the presence of specialized works, in particular in the wedding district, and for the
employees’ mobility, even if the expenditure for skills and learning is very limited. In fact, the firms should invest more, not only in R&D and staff training, but they also have to pay more attention to the organizational form adopted which is one of the most important resources that provide a competitive advantage and one of the most valuable resources for both the business and its customers.

8.7 Innovation and Social Capabilities: the Empirical Results

After the construction of the Social Capabilities indicator and the description of SC diffusion in the special clothing district, in this section, the last step is to verify how the Social Capabilities impact on the innovation of the firms in the special clothing district composed of wedding and baby clothing. We verify the SC impact on the innovation of the firms in the wedding and in the baby districts, too.

The empirical analysis is soundly-based on the use of a data-set constructed derived from questionnaire responses of the two case studies estimating the innovation equation utilized by Cainelli, Mancinelli and Mazzanti (2007). Our innovation equation is adapted to our case study and to our data-set.

We describe before the used variables (Table 33) and we highlight our problems connected to the Probit estimation, we present some correlations and descriptive statistics concerning the used variables (Tables 34, 35 and 36), some results of the survey concerning the relationship between the firm size and the expenditure in R&D and Design (RD,D) and the relationship between the firm size and innovation (Tables 37 and 38). Finally, using STATA program, we estimate the following regression (3) in the year 2011.

---

70 Cainelli G., Mancinelli S. and Mazzanti M. (2007) in their work, in order to estimate the innovation equation, use, as a dependent variable, a proxy of innovative activity and R&D, and social capital/networks as explicative variables. They also include a set of control variables (firm typology, size, age, and export propensity) to better specify the vector of innovation inputs.

71 To this regard, see footnote 48.
(3) \( \text{INN}_{i,t} = 1 \) if \( \text{INN}_{i,t} = \beta_0 + \beta_1 \text{SC}_{i,t} + \beta_2 \text{KEFROMIK}_{i,t} + \beta_3 \text{KEFROMMK}_{i,t} + \beta_4 \text{MC}_{i,t} + \beta_5 \text{LNRDD}_{i,t} + \beta_6 \text{AGE}_{i,t} + \beta_7 \text{SIZE}_{i,t} + \varepsilon_{i,t} \)

\( \text{INN}_{i,t} = 0 \) otherwise

where:

- \( \text{INN}_{i,t} \) is a binary variable taking the value 1 whether the firm \( i \) introduced technological innovations in the year 2011, 0 otherwise;
- \( \text{SC}_{i,t} \) represents the average value of the SN (social network), FN (firm network), IN (institutional network) and GS (geographical space) dimensions of firm \( i \) in period \( t \). This variable catches the most important SC dimensions in the industrial district.
- \( \text{KEFROMIK}_{i,t} \) represents the exchange of knowledge/information derives from knowledge innovation of firm \( i \) in period \( t \). This variable catches the source of information/knowledge derived strictly from Knowledge Innovation and it is one of SC dimensions.
- \( \text{KEFROMMK}_{i,t} \) represents the exchange of knowledge/information derives from knowledge marketing of firm \( i \) in period \( t \). This variable catches the source of information/knowledge derived strictly from Knowledge Market and it is one of SC dimensions.
- \( \text{MC}_{i,t} \) represents the marketing capabilities of firm \( i \) in period \( t \). It is another SC dimension.
- \( \text{LNRDD}_{i,t} \) is the R&D and Design expenditure indicator of firm \( i \) in period \( t \). As the literature has shown (OECD, 2002 and EUROSTAT, 2005; Malerba, 2005), this variable is an input for the innovation output. To measure this variable we consider the natural logarithm of Expenditure in R&D,D/labour number of firm \( i \) in period \( t \).
- \( \text{AGE}_{i,t} \) is a control variable, we include to better specify the vector of innovation inputs and at the same time it catches one Marshallian district characteristic. The AGE control variable, in fact, represents the years of experience of the firm \( i \) in period \( t \). To measure the firm AGE, we have normalized the “year variables” with the “Min-Max” method.
- \( \text{SIZE}_{i,t} \) is a control variable, we include to better specify the vector of innovation inputs and at the same time it catches one Marshallian district characteristic. To measure the firm SIZE we consider the natural logarithm of labour number of the firm \( i \) in period \( t \).
- \( \varepsilon_{i,t} \) is the error term.

Table 33 describes the used variables.
Table 33 - Variables used in the empirical models

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEPENDENT VARIABLE</strong></td>
<td></td>
</tr>
<tr>
<td>INN</td>
<td>Innovation</td>
</tr>
<tr>
<td><strong>SOCIAL CAPABILITIES VARIABLES</strong></td>
<td></td>
</tr>
<tr>
<td>SC1</td>
<td>Social Capabilities 1 is composed of Geographical Space (GS), Firm networks (FN), Social Networks (SN) and Institutional Networks (IN) dimensions of firm i in period t</td>
</tr>
<tr>
<td>KEfromIK</td>
<td>Exchange of knowledge/information connected to the innovation knowledge of firm i in period t</td>
</tr>
<tr>
<td>KEfromMK</td>
<td>Exchange of knowledge/information connected to the market knowledge of firm i in period t</td>
</tr>
<tr>
<td>MC</td>
<td>Marketing Capabilities of firm i in period t</td>
</tr>
<tr>
<td><strong>INPUT VARIABLE</strong></td>
<td></td>
</tr>
<tr>
<td>LNRDD</td>
<td>Natural logarithm of Expenditure in R&amp;D/labour number of firm i in period t</td>
</tr>
<tr>
<td><strong>CONTROL VARIABLES</strong></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>Years of experience of the firm i in period t</td>
</tr>
<tr>
<td>SIZE</td>
<td>Natural logarithm of labour number of the firm i in period t</td>
</tr>
</tbody>
</table>

The most important problem of our data-base is represented by the innovation (INN) output utilized as a dependent variable. Based on the theoretical part of this study (Chapter 2), where we have analyzed the concept of innovation and the different typologies of innovation, we have highlighted how innovation is a complex, diversified activity with many interacting components and it is difficult to measure it with certainty. Particularly, quoting Oslo manual (2005), “The complexity of the innovation process and the variations in the way it occurs in different types of firms and industries [industrial districts] means that clear-cut definitions are not always possible and conventions have to be adopted.” (p.31). At the same time “When firms innovate, they are engaging in a complex set of activities with multiple outcomes…” (Oslo manual, 2005, p. 28). Considering that, we adopt the Schumpeterian definition of innovation given in the theoretical part of this work (see section 2.6, Chapter 2), where innovation is considered the introduction of a new good, a new production method, and a new industrial organization. We add the importance of the design activity (Utterback and Abernthy, 1975, 1978) for the particular sector we analyze. We also add other innovation activities related to the particular sector in exam and related to the survey approach (Oslo manual, 2005, p.29). According to this approach, we believe that the only way to measure the INN variable is with the use of average of follow normalized variables:

- CAD (Computer-Aided Design) or CAM (Computer-Aided Manufacturing) use in 2011.
- Process experiment number (prototype) in 2011.
- Product experiment number (prototype) in 2011.
-Introduction of new products in 2011
-Introduction of new processes in 2011
-Introduction of new organizational methods in 2011
-Introduction of demand-driven innovation in 2011
-Design activities performed in house or with other firms in 2011.

It is necessary to precise that these variables, at the same time, measure in part the IC (Innovation Capabilities) indicator that is one of the SC characteristic composed of input and output normalized variables (see sub-section F of this Chapter).72 We must remember that we have considered the IC (Innovation Capability) dimension in the Social Capabilities because as we have demonstrated in the theoretical part, the relationship among knowledge, Social Capabilities and innovation is continuous. In other words, knowledge and Social Capabilities feed innovation and they are then fed in their turn. More specifically innovation is the outcome of the processes of knowledge creation but at the same time Social Capabilities and knowledge are the outputs of innovative activities.

The IC dimension cannot be replicated in the regression as an explicative variable to avoid duplication of estimates. In fact the correlation between INN and IC is very high (see Table 34). At the same time we can unpack the IC index (see sub-section F in this Chapter) and we can utilize expenditure in R&D and Design in 2011 as an input variable in the regression.

As we have remarked to explain Table 31, and as we confirm in Table 34, the correlation between SN (social networks) and GS (geographical space) is negative because knowledge is often transmitted only within the same firm. The SN indicator is instead positively correlated with the INN variable as well as with the FN (firm networks) indicator, the IN (institutional networks) indicator, the KEfromIK indicator (knowledge exchange connected to innovation knowledge) and the KEfromMK indicator (knowledge exchange connected to market knowledge) according to the theoretical part of this study. In fact we have marked the importance of social, firm and institutional networks for the knowledge diffusion and creation of knowledge and innovation and we have highlighted as a higher level of knowledge and Social Capabilities corresponds to a higher degree of innovation (see sections 2.6 and 3.6). The GS indicator presents the lowest coefficients of correlation with innovation because the local space alone is not by itself a source of innovation.

It is important to remark that we combine together SN, FN, IN and GS dimensions or, in other words, the most important Social Capabilities dimensions, which catch the localized knowledge,

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72 The Innovation Capabilities inputs are: Researchers number/Employees number in 2011; Expenditure in R&D and design in 2011; Expenditure in learning in 2011; Expenditure in skills in 2011.
and the spillover effects of the special industrial district and we call it SC1. SC1 is the average of SN, FN, IN and GS dimensions. It is possible to consider together SN, FN, IN and GS dimensions because they are not correlated each other and we consider the Becattini’s definition of the industrial district in neo-Marshallian perspective just considered in the theoretical part, where Becattini defines an industrial district as "<...a socio-territorial entity characterized by the active presence of a community of people and a population of firms in a given historical and geographical space>>" (trans. Becattini, 2000, p.44).

The KEFROMIK and KEFROMMK dimensions are positively correlated with innovation because they represent the Social Capabilities dimensions that catch the capacity to decode, access and absorb knowledge from other sources as, for example, trade fairs, specialised magazines (see sub-section D in this Chapter). It is necessary to specify that KEFROMIK and KEFROMMK are highly correlated each other. For this reason we do not combine together these two dimensions in one only variable and we do not utilize at the same time these two dimensions in our Probit model. We utilize one time only KEFROMIK variable and one time KEFROMMK variable. We can also observe that KEFROMIK is highly correlated with FN. It is a limit of the Probit model, but it depends, probably, on the small number of observations and on SC intangible dimension that gives some problems when it is used in the empirical estimation. It seems that KEFROMIK and FN are statistical replications. We have verified that these two dimensions seem to be composed of the same variables, but in reality they catch different aspects and they derive from different answers to the questionnaires. These differences are more perceptible considering the descriptive analysis of the survey results (Chapter 7).

The MC (Market Capabilities) dimension is positively correlated with innovations because as we have highlighted in sub-section G, innovation is influenced by the necessity to enter new market segments, to use new slogans. We prefer to analyse this Social Capabilities dimension only because it is strictly connected to the market, web use, marketing expenditure and so on (see sub-section G of this Chapter).

Differently to Cainelli, Mancinelli and Mazzanti’s innovation equation, we do not use firm typology and firm export propensity as control variables because firm typology has multi-collinear problem and the export propensity variable is characterized by highly correlation with MC; KEFROMIK, KEFROMMK, SC1 (Table 35). Considering Table 35 we note that the first limit to the Probit estimation is that KEFROMIK and KEFROMMK have a high correlation each other, but as we have said before, we can utilize KEFROMIK once and KEFROMMK another time. It is impossible to use a dummy that catches the IK specialization (X1=1) or the MK specialization
(X₁=0) because this solution presents collinear problems. As we have remarked before, the second limit is that KEFROMIK and KEFROMMK are highly correlated with SC1. To solve this problem we also estimate our Probit with only SC1 dimension to verify the results.

The considered variables are positively correlated with the innovation. The only exception is represented by the AGE control variable. This is negative correlated with INN as well as with KEFROMIK and KEFROMMK because in a global context where the firms operate, the experience is not more important unlike what the traditional literature upheld about industrial districts. On the contrary it is important the rapid technological change that the youngest firms can assure. Our expectation is that AGE variable is negative in our Probit estimation.

Table 34 – Correlation among Innovation and Social Capabilities dimensions in the Special clothing district

<table>
<thead>
<tr>
<th></th>
<th>INN</th>
<th>IC</th>
<th>MC</th>
<th>GS</th>
<th>FN</th>
<th>IN</th>
<th>SN</th>
<th>KEfromIK</th>
<th>KEfromMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>INN</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC</td>
<td>0.763</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>0.507</td>
<td>0.665</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GS</td>
<td>0.170</td>
<td>0.207</td>
<td>0.070</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN</td>
<td>0.424</td>
<td>0.499</td>
<td>0.518</td>
<td>0.187</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>0.300</td>
<td>0.390</td>
<td>0.440</td>
<td>0.062</td>
<td>0.504</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.303</td>
<td>0.298</td>
<td>0.419</td>
<td>-0.112</td>
<td>0.379</td>
<td>0.241</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEfromIK</td>
<td>0.390</td>
<td>0.502</td>
<td>0.516</td>
<td>0.237</td>
<td>0.911</td>
<td>0.691</td>
<td>0.334</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>KEfromMK</td>
<td>0.399</td>
<td>0.487</td>
<td>0.627</td>
<td>0.260</td>
<td>0.790</td>
<td>0.547</td>
<td>0.337</td>
<td>0.825</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 35 – Correlation among Innovation, SIZE, AGE, EXP, KEfromIK, KEfromMK, SC1 and LNRDD in the Special clothing district

<table>
<thead>
<tr>
<th></th>
<th>INN</th>
<th>SIZE</th>
<th>AGE</th>
<th>EXP</th>
<th>MC</th>
<th>KEfromIK</th>
<th>KEfromMK</th>
<th>SC1</th>
<th>LNRDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>INN</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>0.582</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>-0.023</td>
<td>0.202</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXP</td>
<td>0.516</td>
<td>0.619</td>
<td>0.017</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>0.507</td>
<td>0.576</td>
<td>0.034</td>
<td>0.794</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEfromIK</td>
<td>0.390</td>
<td>0.479</td>
<td>-0.067</td>
<td>0.620</td>
<td>0.516</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEfromMK</td>
<td>0.399</td>
<td>0.536</td>
<td>-0.086</td>
<td>0.764</td>
<td>0.627</td>
<td>0.825</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC1</td>
<td>0.477</td>
<td>0.532</td>
<td>0.018</td>
<td>0.654</td>
<td>0.550</td>
<td>0.855</td>
<td>0.765</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.449</td>
<td>0.492</td>
<td>0.026</td>
<td>0.389</td>
<td>0.508</td>
<td>0.252</td>
<td>0.291</td>
<td>0.287</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 36 – Descriptive statistics in the Special clothing district

<table>
<thead>
<tr>
<th>Variables</th>
<th>N. Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>INN</td>
<td>72</td>
<td>0.736</td>
<td>0.443</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SIZE</td>
<td>72</td>
<td>2.408</td>
<td>1.388</td>
<td>0</td>
<td>5.01</td>
</tr>
<tr>
<td>AGE</td>
<td>72</td>
<td>0.356</td>
<td>0.250</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>EXP</td>
<td>72</td>
<td>0.690</td>
<td>0.376</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>MC</td>
<td>72</td>
<td>0.640</td>
<td>0.242</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>KEFROMIK</td>
<td>72</td>
<td>0.519</td>
<td>0.224</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>KEFROMMK</td>
<td>72</td>
<td>0.518</td>
<td>0.230</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SC1</td>
<td>72</td>
<td>0.513</td>
<td>0.158</td>
<td>0.13</td>
<td>0.9</td>
</tr>
<tr>
<td>LNRDD</td>
<td>72</td>
<td>4.722</td>
<td>3.542</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

From the Tables 37 and 38 it emerges that, considering the firm size, the percentage of innovative firms, in this industrial district, is high, particularly considering the product innovation rather than
the process innovation. This tendency increases in accordance with the firm size for the product innovation; on the contrary this tendency is not confirmed for the process innovation probably because, in this case, the machinery is a substitute for the manual work. The expenditure in R&D,D and the expenditure in marketing per employee is high, but it is not dependent on the firm size. In fact the firms with a size classes between 10-19 and between 10-49 expend more per employee.

**Table 37 – Firm size, R&D,D and Marketing expenditure per employee in Special clothing district**

<table>
<thead>
<tr>
<th>Size Classes</th>
<th>Firms</th>
<th>Firms</th>
<th>Employees</th>
<th>Employees</th>
<th>R&amp;D,D per employee</th>
<th>Marketing per employee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N.</td>
<td>%</td>
<td>N.</td>
<td>%</td>
<td>€</td>
<td>€</td>
</tr>
<tr>
<td>0</td>
<td>11</td>
<td>15.3</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>1.‐9</td>
<td>16</td>
<td>22.2</td>
<td>79</td>
<td>4.7</td>
<td>835.4</td>
<td>778.4</td>
</tr>
<tr>
<td>10.‐19</td>
<td>15</td>
<td>20.8</td>
<td>178</td>
<td>10.6</td>
<td>2,626.4</td>
<td>2,059.2</td>
</tr>
<tr>
<td>20.‐49</td>
<td>20</td>
<td>27.8</td>
<td>564</td>
<td>33.5</td>
<td>1,670.2</td>
<td>1,799.6</td>
</tr>
<tr>
<td>50.‐250</td>
<td>10</td>
<td>13.9</td>
<td>861</td>
<td>51.2</td>
<td>998.8</td>
<td>836.2</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100.0</td>
<td>1,682</td>
<td>100.0</td>
<td>1,425.4</td>
<td>1,299.7</td>
</tr>
</tbody>
</table>

Source: our elaboration investigation

**Table 38 – Firm size and Innovation in Special clothing district**

<table>
<thead>
<tr>
<th>Size Classes</th>
<th>Product Innovation</th>
<th>Process innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>0</td>
<td>6.8</td>
<td>2.4</td>
</tr>
<tr>
<td>1‐9</td>
<td>14.4</td>
<td>28.9</td>
</tr>
<tr>
<td>10.‐19</td>
<td>18.3</td>
<td>30.1</td>
</tr>
<tr>
<td>20‐49</td>
<td>25.5</td>
<td>22.9</td>
</tr>
<tr>
<td>50‐250</td>
<td>35.0</td>
<td>15.7</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: our elaboration investigation

8.7.1 The Empirical Results in the Special Clothing District

The econometric results based on the Probit model reporting the marginal effects are presented in this sub-section for the Special Clothing District. The estimates are carried out adopting a “robust” estimator for the Probit model to solve the heteroskedasticity problem. As we have remarked before, we use different combinations of the same specification because of the limits of the Probit model and data-base and because we found some interesting results. For this reason we also consider other tests as AIC (Akaike Information Criterion), BIC (Bayesian Information Criterion) and correctly classified in percentage to compare results estimated. If AIC and BIC allow to
compare the adaptation of Probit model alternative combinations, the difficulty arises, as it often happens, when different selection criteria have led to conflicting test results.

We begin with the estimation of the following regression (4) where we consider KEFROMIK only and we exclude KEFROMMMK because as we have just remarked they are highly correlated.

\[
\text{(4) } \text{INN}_{it}=1 \text{ if } \text{INN}_{it}=\beta_0+\beta_1 \text{SC}_{1t}+\beta_2 \text{KEFROMIK}_{it}+\beta_3 \text{MC}_{it}+\beta_4 \text{LNRDD}_{it}+
\beta_5 \text{AGE}_{it}+\beta_6 \text{SIZE}_{it}+\epsilon_{it}
\]

\[
\text{INN}_{it}=0 \text{ otherwise}
\]

The results in Table 39 show some interesting evidence with regard to the impacts that the selected variables have on innovation in the special clothing district with a good value of pseudo- $R^2$, a good value of AIC, BIC and the overall rate of correctly classification is estimated to be 86.11.

<table>
<thead>
<tr>
<th>Estimation Method</th>
<th>Probit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variables</td>
<td>Coefficient $\beta$</td>
</tr>
<tr>
<td>SC1</td>
<td>4.584</td>
</tr>
<tr>
<td>KEfromIK</td>
<td>-2.290</td>
</tr>
<tr>
<td>MC</td>
<td>1.218</td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.052</td>
</tr>
<tr>
<td>AGE</td>
<td>-1.184</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.532</td>
</tr>
<tr>
<td>cons</td>
<td>-2.083</td>
</tr>
<tr>
<td>N. of obs.</td>
<td>72</td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td>0.4265</td>
</tr>
<tr>
<td>Obs. P</td>
<td>0.736</td>
</tr>
<tr>
<td>Pred. P</td>
<td>0.832</td>
</tr>
<tr>
<td>Log pseudolikelihood</td>
<td>-23.829</td>
</tr>
<tr>
<td>Prob $&gt;chi2$</td>
<td>0.0005</td>
</tr>
<tr>
<td>AIC</td>
<td>61.65836</td>
</tr>
<tr>
<td>BIC</td>
<td>77.59502</td>
</tr>
<tr>
<td>Correctly classified</td>
<td>86.11%</td>
</tr>
</tbody>
</table>

Estimated by maximum likelihood
$\frac{\partial P}{\partial x}$ estimated at mean values

The SC1 variable is significant as the marginal effect. This variable catches the most important Social Capabilities dimensions of the special industrial district and it represents for this industrial district, a great likelihood to make innovation thanks to the knowledge diffusion, creation and combination through social, firm and institutional networks localized in the district. In other words,
the relational characteristics, the internal and external ties are important. SC1 catches the spillover effects of the special industrial district too.

The SIZE variable is significant, but its marginal effect is low. It is an apparently ambiguous result. According to the Tables 36 and 37 and according to the theoretical framework based on Schumpeterian Mark I, we can deduce that the small and medium firms of the district make innovation. In reality if it is probably true in general, considering the marginal effect equal to 13%, our result is different. In fact considering contextually these results, we can explain that only few firms have the capacity to make innovation. Probably they are the biggest firms and/or the firms that represent the point of union between the two industrial districts. We have called these firms “pioneer firms” in Chapter 7, and they represent the most dynamic firms.

The AGE variable is negative as we expected considering the Table 35, because in our case study and in a global context the years of experience of the business district, important in terms of acquired skills, lose their importance and indeed the experience is related negatively with innovation. This result, even if not significant, helps us to understand that the oldest firms in the district innovate a little or less in comparison with the youngest ones and they are a little or less related with the other Italian and foreign companies unlike what happens to the youngest firms. The latter, in fact, precisely because they are young and they were born in a highly competitive environment, are more attentive to innovation and at the same time they benefit from the experience of the oldest ones. The oldest firms, moreover, are enterprises more linked to traditions.

In reality this result, as we have already mentioned, is in contrast with the traditional literature about industrial district. In fact for the traditional literature about industrial district the years of experience are one of the most important characteristic of the industrial district. We have started from this hypothesis: the years of experience of a firm contribute to maintain a competitive advantage. On the contrary the empirical result entails to change this hypothesis. In other words, the oldest firms of the modern industrial district do not make a lot of innovation, instead the youngest firms make more innovations and at the same time they benefit from the past experience.

KEFROMIK variable is not significant because in contrast to the theoretical part, in the special clothing district, firms do not have the capacity to exchange knowledge connected to knowledge innovation and it derives from other sources (for example fairs, specialized magazines, national and international markets, contacts with commercial agents…), but only information is captured. In some cases, the higher the number of commercial agents - some companies have also 2000 – the less the exchange of information, because the ad personam relationships are too many to manage.

This source of information does not have the capacity to develop innovation. On the contrary, a boomerang effect takes place, because these other sources of information influence negatively the
innovation. Some contacts therefore become a good source for our firm product imitation. It seems that only our products, our design technique, our method of production are source of new knowledge for the external rivals to the district.

The MC variable is not significant because the capability to create and to move into new Countries, into new market segments, to use the web for marketing is not a direct input of innovation in our case study and it is in contrast with the theoretical assumption.

The LNRDD variable in the special clothing district is not significant as our expectation because of the period when we have addressed the questionnaire, because of the sector low-tech and because developing innovation output needs time so that R&D input is transformed into innovative output.

On the contrary this expenditure per employee is important considering the size classes (Table 36).

Now we consider KEFROMMK only and we exclude KEFROMIK from the Probit model.

The regression is the following and the results are presented in Table 40:

\[
(5) \quad \text{INN}_{it} = \begin{cases} 1 & \text{if} \quad \text{INN}_{it} = \beta_0 + \beta_1 \text{SC}_{1i,t} + \beta_2 \text{KEFROMMK}_{i,t} + \beta_3 \text{MC}_{i,t} + \beta_4 \text{LNRDD}_{it} + \\
0 & \text{otherwise}
\end{cases}
\]

The results also in this case show some interesting evidence with regard to the impacts that the selected variables have on innovation in the special clothing district but they are very similar to the previous ones and the reasons are the same. SC1 variable and SIZE variable are significant with a good marginal effect for the first variable and a low marginal effect for the second variable. The reason of these results is the same of the first hypothesis. LNRDD variable is positive, but it is not significant as in the previous estimation. AGE is negative, but it is not significant. MC variable is not significant. The difference in comparison to the previous estimation is represented to the KEFROMMK variable that is negative as the KEFROMIK, but it is significant at 10\%. In this case the negative boomerang effect related to the knowledge market or in other words the information on the consumer’s preferences, on the new national and international markets and on the latest trends in colors and materials is more important.

In this case the Probit model also presents a good value of pseudo-$R^2$, a good value of AIC, BIC and the overall rate of correctly classification is estimated to be 88.89. AIC and BIC scores are better respect to the precedent case where we have used KEFROMIK (Table 39) as well as the correctly classification.
Table 40 - Probit estimates of the likelihood of innovation in the Special clothing district in 2011 with KEFROMMK

<table>
<thead>
<tr>
<th>Estimation Method</th>
<th>Probit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variables</td>
<td>INN</td>
</tr>
<tr>
<td><strong>Coefficient</strong></td>
<td><strong>β</strong></td>
</tr>
<tr>
<td>SC1</td>
<td>3.380</td>
</tr>
<tr>
<td>KEfromMK</td>
<td>-2.367</td>
</tr>
<tr>
<td>MC</td>
<td>1.935</td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.045</td>
</tr>
<tr>
<td>AGE</td>
<td>-1.319</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.609</td>
</tr>
<tr>
<td>cons</td>
<td>-1.973</td>
</tr>
<tr>
<td><strong>N. of obs.</strong></td>
<td>72</td>
</tr>
<tr>
<td><strong>Pseudo R^2</strong></td>
<td>0.4359</td>
</tr>
<tr>
<td><strong>Obs. P</strong></td>
<td>0.736</td>
</tr>
<tr>
<td><strong>Pred. P</strong></td>
<td>0.837</td>
</tr>
<tr>
<td><strong>Log pseudolikelihood</strong></td>
<td>-23.438</td>
</tr>
<tr>
<td><strong>Prob &gt;chi2</strong></td>
<td>0.0019</td>
</tr>
<tr>
<td><strong>AIC</strong></td>
<td>60.87778</td>
</tr>
<tr>
<td><strong>BIC</strong></td>
<td>76.81444</td>
</tr>
<tr>
<td><strong>Correctly classified</strong></td>
<td>88.89%</td>
</tr>
</tbody>
</table>

*Estimated by maximum likelihood
♂significant at 10%
♂∂P/∂x estimated at mean values

As we have specified in the first part of this section, where we have remarked the highly correlation among SC1, KEFROMIK and KEFROMMK, we estimate the following regression (6) in which we do not consider neither KEFROMIK nor KEFROMMK as explicative variables.

(6) \( INN_{it}=1 \) if \( INN_{it}=\beta_{0}+\beta_{1}SC1_{it}+\beta_{2}MC_{it}+\beta_{3}LNRDD_{it}+\beta_{4}AGE_{it}+\beta_{5}SIZE_{it}+\epsilon \)

\( INN_{it}=0 \) otherwise

In this case SC1 is unexpectedly not significant (Table 41). The other explicative variables are not significant, with the only exception represented by the SIZE control variable as our expectation.
Table 41 - Probit estimates of the likelihood of innovation in the Special clothing district in 2011 without KEFROMMK and KEFROMMK

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Probit Method</th>
<th>INN</th>
<th>Coefficient $\beta$</th>
<th>z</th>
<th>$P &gt; z$</th>
<th>Robust Std. Err.</th>
<th>$\partial P/\partial x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC1</td>
<td>Probit</td>
<td>INN</td>
<td>1.544</td>
<td>1.02</td>
<td>0.308</td>
<td>1.516</td>
<td>0.407</td>
</tr>
<tr>
<td>MC</td>
<td>Probit</td>
<td>INN</td>
<td>1.067</td>
<td>0.98</td>
<td>0.328</td>
<td>1.092</td>
<td>0.281</td>
</tr>
<tr>
<td>LNRDD</td>
<td>Probit</td>
<td>INN</td>
<td>0.057</td>
<td>0.96</td>
<td>0.335</td>
<td>0.059</td>
<td>0.015</td>
</tr>
<tr>
<td>AGE</td>
<td>Probit</td>
<td>INN</td>
<td>-0.846</td>
<td>-1.02</td>
<td>0.307</td>
<td>0.829</td>
<td>-0.223</td>
</tr>
<tr>
<td>SIZE</td>
<td>Probit</td>
<td>INN</td>
<td>0.512</td>
<td>2.66</td>
<td>0.008</td>
<td>0.192</td>
<td>0.135</td>
</tr>
<tr>
<td>cons</td>
<td>Probit</td>
<td>INN</td>
<td>-1.769</td>
<td>-2.24</td>
<td>0.025</td>
<td>0.788</td>
<td></td>
</tr>
</tbody>
</table>

N. of obs. 72
Pseudo $R^2$ 0.4081
Obs. P 0.736
Pred. P 0.818
Log pseudolikelihood -24.592
Prob $> \chi^2$ 0.0006
AIC 61.18457
BIC 74.84457
Correctly classified 83.33%

Estimated by maximum likelihood
$\partial P/\partial x$ estimated at mean values

Trying to understand this result, we eliminate from the estimate also the control variables SIZE and AGE. We also exclude the variable MC because we want to focus our attention only on the variables SC1 and LNRDD and we get the solution to this "strange" result. The regression is the follow (7) and the results are presented in Table 42.

\[
(7) \quad \text{INN}_{it} = 1 \text{ if } \text{INN}_{it} = \beta_0 + \beta_1 \text{SC1}_{it} + \beta_2 \text{LNRDD}_{it} + \epsilon_{it} \\
\text{INN}_{it} = 0 \text{ otherwise}
\]

Table 42 - Probit estimates of the likelihood of innovation in the Special clothing district in 2011 with SC1 and LNRDD

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Probit Method</th>
<th>INN</th>
<th>Coefficient $\beta$</th>
<th>z</th>
<th>$P &gt; z$</th>
<th>Robust Std. Err.</th>
<th>$\partial P/\partial x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC1</td>
<td>Probit</td>
<td>INN</td>
<td>4.234</td>
<td>3.00</td>
<td>0.003</td>
<td>1.412</td>
<td>1.182</td>
</tr>
<tr>
<td>LNRDD</td>
<td>Probit</td>
<td>INN</td>
<td>0.138</td>
<td>2.38</td>
<td>0.017</td>
<td>0.058</td>
<td>0.038</td>
</tr>
<tr>
<td>cons</td>
<td>Probit</td>
<td>INN</td>
<td>-1.982</td>
<td>-2.94</td>
<td>0.003</td>
<td>0.673</td>
<td></td>
</tr>
</tbody>
</table>

N. of obs. 72
Pseudo $R^2$ 0.3083
Obs. P 0.736
Pred. P 0.800
Log pseudolikelihood -28.741
Prob $> \chi^2$ 0.0003
AIC 63.48369
BIC 70.31369
Correctly classified 80.56%

Estimated by maximum likelihood
$\partial P/\partial x$ estimated at mean values

244
In this case SC1 variable is significant as the marginal effect; LNRDD is significant, but the marginal effect is low. These results demonstrate that SC1 is a proxy of SIZE and AGE control variables. In other words, these results confirm the fact that the only biggest firms have the capacity to absorb internal and external knowledge, to diffuse knowledge in the district, to build relationships with the smallest firms through sub-contracts and to make R&D,D. The special industrial district is composed of few oligopolistic firms. These firms are very dynamic and they are the core of the district as we have also demonstrated considering the results of the Probit model described in Tables 39 and 40. The fact that few firms make innovation is confirmed by the marginal effect of LNRDD that is very low and equal to 3%. Instead the SC1 variable is very important thanks to these oligopolistic firms that can activate mechanisms of absorption, creation and knowledge spillover. In this model the AIC value is higher than the more complex regressions (4) and (5) whereas the BIC score is lower in Table 42 respect to the previous results, but it can happen in Probit model. The Pseudo-R² instead is lower respect to the precedent cases, but it is still good. If we consider the principle of parsimony and if we remember that the BIC index takes into account both the statistical goodness of fit and the number of parameters that have to be estimated to achieve this particular degree of fit, by imposing a penalty for increasing the number of parameters, we think that Table 42 presents the best results.

Now we unpack SC1 variable to investigate which of these dimensions influence innovation and we estimate the following regression (8), we found that SN variable is significant as well as the LNRDD variable (Table 43). Instead FN, IN and GS variables are not significant. The value of pseudo- R² is still good, but the AIC and BIC values are higher respect the results presented in Table 42. The classification is correctly at 80.56%.

The results of this Probit model with these selected variables strengthen in any case our precedent thesis that is to say the core of the special clothing district is made by few and dynamic oligopolistic firms. These firms create a group in the district (Cainelli et al, 2006) and probably only their R&D,D activity plays a key role in the creation of a novelty in the innovation (Oslo Manual, 2005, p.78). The marginal effect of LNRDD is in fact equal to 3%. These few oligopolistic firms manage to activate mechanisms to absorb, create and disseminate the tacit knowledge in the district through social networks and to involve other firms district in their social network, whose marginal effect is good (50%). In other words, the socialization, which represents one of the most important

73 In the Oslo Manual (2005) it is evidenced that “…it is quite important to be able to distinguish between the characteristics of those innovations which are new to the world, or perhaps to the country, as compared to those which are new only to the firm itself. As most firms will have introduced a range of innovations in the collection period, it is very difficult to report on novelty in respect of the firm’s total innovation activities by using the subject approach” as it is in our case study. (p.78).
phases of Nonaka and Takeuchi’s model described in the theoretical part, is important. In fact, the relational characteristic, the internal and external weak ties, the knowledge transfer through interpersonal relationships are important.

\[
(8) \text{INN}_{it} = 1 \text{ if } \text{INN}_{it} = \beta_0 + \beta_1 \text{SN}_{it} + \beta_2 \text{FN}_{it} + \beta_3 \text{IN}_{it} + \beta_4 \text{GS}_{it} + \beta_5 \text{LNRDD}_{it} + \epsilon_{it} \\
\text{INN}_{it} = 0 \text{ otherwise}
\]

Table 43 - Probit estimates of the likelihood of innovation in the Special clothing district in 2011 with SN, FN, IN, GS and LNRDD

<table>
<thead>
<tr>
<th>Estimation Method</th>
<th>Probit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variables</td>
<td>INN</td>
</tr>
<tr>
<td>Coefficient $\beta$</td>
<td>$z$</td>
</tr>
<tr>
<td>SN</td>
<td>1.842</td>
</tr>
<tr>
<td>FN</td>
<td>0.838</td>
</tr>
<tr>
<td>IN</td>
<td>0.989</td>
</tr>
<tr>
<td>GS</td>
<td>0.846</td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.136</td>
</tr>
<tr>
<td>cons</td>
<td>-1.904</td>
</tr>
</tbody>
</table>

N. of obs. 72
Pseudo $R^2$ 0.3081
Obs. P 0.736
Pred. P 0.800
Log pseudolikelihood -28.749
Prob > chi2 0.0002
AIC 69.4995
BIC 83.15949
Correctly classified 80.56%

Estimated by maximum likelihood
$\partial P/\partial x$ estimated at mean values

Analysing the survey results we can confirm that the performance and the strategic choices are different in the two categories forming the special clothing district even though the firms are located in the same area. To this regard it is useful for our study to estimate the same Probit models (7) and (8) for the wedding industrial district and for the baby industrial district.

8.7.2 The Empirical Results in the Wedding Industrial District and in the Baby Industrial District

The econometric results based on the Probit model reporting the marginal effects are presented in this section for the Wedding Industrial District and for the Baby Industrial District, even if the number of observation is small. The estimates of the regressions (7) and (8) are carried out adopting a “robust” estimator for the Probit model and the results are presented in Tables 45 and 46 for the Wedding Industrial District and in Tables 48 and 49 for the Baby Industrial District. In this case also we exclude KEFROMIK and KE FROMMK variables from the estimation because of the high
correlation with SC1 (Table 44). SIZE and AGE control variables are also excluded because in this case SC1 can be considered their proxy, too.

In the Wedding Industrial District, the most important SC characteristics, included in SC1, are significant at 10% (Table 45), with important marginal effect on innovation. The expenditure in R&D, D is also significant at 10%, but in this case the marginal effect on innovation is low. The Pseudo- $R^2$ is low as well as the other tests because the number of observations is small even if it is representative of the district. From the estimation results and the low marginal effects of LNRDD variable, it is clear that, in this district, a few firms (approximately 7%) carry out an activity of R&D, such as to bring innovation to the district and to absorb knowledge, and to create tacit knowledge, which, in turn, creates innovation. It would seem that the atmosphere of Marshall's memory about traditional industrial districts is disappearing, as we highlighted in theoretical part (Chapter 4), since the main characteristics of the district Social Capabilities, caught precisely by SC1, have a low probability to create innovation. However, since the marginal effects are high, this means that even the remained few district relations have the ability to generate high tacit knowledge and innovation.

We can explain better these results analyzing Table 46, where we have considered the SC1 variable single dimensions. It shows that the only FN variable is significant with a good marginal effect. The other explicative variables are not significant and particularly the IN and GS variables are negative. From these results, we can deduce that the firms, although not cooperating with each other, as demonstrated by the results of the descriptive analysis (Chapter 7), exchange unconsciously tacit knowledge, though, for example, the observation for imitation. In fact, as we have remarked in the theoretical part (Chapter 2), in this case we refer above all to that typology of knowledge "<<non codified, but, in principle codified knowledge>>" (Witt et al, 2007, p.6) that it cannot be transmitted among individuals interactions, but through trial and error learning.

The firm networks are also important for the intensity of cooperation with local, national and international suppliers that help the exchange of knowledge and technology.

In the Wedding district, not only direct and indirect relationship with some suppliers but also the knowledge diffusion through subcontracts and mutual trust are important. As we have remarked in Chapter 7, some of the small firms produce for third parties and they are important channels of knowledge transfer inside and outside the district. The synergy that is created between the production system and the institutions, although important, considering the high correlation between FN and IN, is not sufficient to generate innovation. The institutional networks (IN) are not
significant, as our expectation, and they do not induce competitive dynamics through the industrial district.

In other words and according to the theoretical part, firms can be seen as a knowledge system (Tsoukas, 1996; Powell and Grodal, 2005) with capabilities to coordinate learning processes in which knowledge is the key resource (Antonelli and Nosvelli, 2008). Firms, in the wedding case, facilitate directly and indirectly knowledge diffusion (Witt et al., 2007), knowledge acquisition through learning by doing (Penrose, 1959; Arrow, 1962), learning by using (Rosenberg, 1982), learning by interacting (Lundvall, 1992) and knowledge creation (Nonaka 1994, Nonaka & Takeuchi 1995). In this district knowledge externalities are not facilitated by the spatial concentration because the GS variable is not significant. On the contrary, the spatial concentration has negative effects on innovation. In this way the geographical diffusion and the geographical openness is more important to absorb new knowledge and, through the firm networks, to create innovation. From these results we can deduce that the only force of firm networks makes the Social Capabilities weak in the district of the wedding, as well as the expenditure in RD,D is not sufficient to influence innovation. Only when all the main dimensions of district Social Capabilities, represented by the SC1 variable, are operating together, the expenditure for RD,D becomes weakly significant (Table 45). The results presented in Table 45 with lower AIC and BIC scores respect to the results of Table 46 suggest that the best model is presented in Table 45 because the model fits the data better.

**Table 44-** Correlations between variables and Innovation in the Wedding Industrial District

<table>
<thead>
<tr>
<th></th>
<th>INN</th>
<th>SCI</th>
<th>LNRDD</th>
<th>MC</th>
<th>KEFROMIK</th>
<th>KEFROMMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>INN</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCI</td>
<td>0.405</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.461</td>
<td>0.243</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>0.486</td>
<td>0.675</td>
<td>0.467</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEFROMIK</td>
<td>0.384</td>
<td>0.886</td>
<td>0.144</td>
<td>0.645</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>KEFROMMK</td>
<td>0.405</td>
<td>0.741</td>
<td>0.219</td>
<td>0.862</td>
<td>0.753</td>
<td>1.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>INN</th>
<th>LNRDD</th>
<th>GS</th>
<th>FN</th>
<th>SN</th>
<th>IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>INN</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.461</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GS</td>
<td>0.186</td>
<td>0.244</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN</td>
<td>0.456</td>
<td>0.203</td>
<td>0.247</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.206</td>
<td>0.182</td>
<td>0.101</td>
<td>0.354</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>0.189</td>
<td>0.014</td>
<td>0.011</td>
<td>0.734</td>
<td>0.373</td>
<td>1.000</td>
</tr>
</tbody>
</table>
Table 45 - Probit estimates of the likelihood of innovation in Wedding industrial district in 2011 with SC1 and LNRDD

<table>
<thead>
<tr>
<th>Estimation Method</th>
<th>Probit</th>
<th>Dependent variables</th>
<th>INN</th>
<th>Coefficient $\beta$</th>
<th>z</th>
<th>$P&gt;z$</th>
<th>Robust Std. Err.</th>
<th>$\frac{\partial P}{\partial x}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC1</td>
<td>Probit</td>
<td></td>
<td>INN</td>
<td>3.109</td>
<td>1.80$^\circ$</td>
<td>0.072</td>
<td>1.725</td>
<td>1.195</td>
</tr>
<tr>
<td>LNRDD</td>
<td></td>
<td></td>
<td></td>
<td>0.189</td>
<td>1.88$^*$$^\circ$</td>
<td>0.060</td>
<td>0.100</td>
<td>0.072</td>
</tr>
<tr>
<td>cons</td>
<td></td>
<td></td>
<td></td>
<td>-1.535</td>
<td>-2.08</td>
<td>0.037</td>
<td>0.737</td>
<td></td>
</tr>
</tbody>
</table>

N. of obs. 30
Pseudo $R^2$ 0.2612
Obs. P 0.566
Pred. P 0.607
Log pseudolikelihood -15.164
Prob $\chi^2$ 0.0083
AIC 36.32957
BIC 40.53316
Correctly classified 73.33%

Estimated by maximum likelihood
$\frac{\partial P}{\partial x}$ estimated at mean values
$^*$$^\circ$ significant at 10%

The estimate results concerning the Baby Industrial District are different.
If we estimate the regression (7) we note that the results presented in Table 48 have a good value of pseudo- $R^2$, a very good value of correctly classification equal to 90.48% and the AIC and BIC test are good. In the Baby industrial district case, the SC1 variable is very significant as its marginal effect that is very important and it supports the innovation of the Baby Industrial District.
The LNRDD variable, on the contrary and unexpectedly, is significant at 10% and the marginal effect is very low. This means that even if in this district and according to Schumpeterian thesis, there are firms of larger dimension that invest more in R&D as shown in the descriptive part of the survey results (Chapter 7), this direct connection has evidently a limit. That is because in the Baby industrial district few bigger and oligopolistic firms are present and they are the core of the district as well as they are the connections of the two industrial districts. They have the capabilities to absorb knowledge from outside and inside the district, to create and to share this knowledge through the district, but they have a modest strength to generate innovation in the whole Baby district.

To unpack the SCI variable, we obtain the results presented in Table 49, that have a better pseudo-$R^2$ respect to the previous value, a very good correctly classified value equal to 90.48%, but the BIC and the AIC scores are higher respect to previous results presented in Table 48.

We can observe from these results that in the Baby industrial district, SN, IN and GS are significant, but their marginal effects on innovation are low; instead FN and LNRDD are not significant. According to the descriptive part of this work, this means that some district firms have contacts with national firms with which they have licensing agreements. The district firms share their knowledge only with these firms outside the district and it does not happen with other firms of the same district. It is for this reason that the firm networks are not significant to promote innovation in the district. We must add that many district firms have internationalized some phases of the production process with a higher labour intensity. It derives that, probably, the expenditure in RD is used outside the district and for this reason it is not significant for the district innovation. In fact, if we consider Table 47, correlation among LNRDD and GS, FN and SN variables is negative.

On the other side, these district firms not only share knowledge with the firms outside the district, but they absorb new external knowledge and they create new knowledge, they share it in the industrial district through social networks and according to Nonaka and Takeuchi’s model, social interaction promotes “knowledge conversion” and innovation in the baby industrial district.

In the Baby industrial district synergy with institutions exists: according to the theoretical literature (Abramovitz, 1989; Amin and Cohender, 2004; Antonelli G. and Nosvelli, 2008) it promotes knowledge, learning and innovation.

In this district, not only the “geographical openness” or the external relations are important, but also the GS variable is significant because according to the theoretical literature (Krugman; 1991; Howells; 2002; Camuffo and Grandinetti, 2005; Cainelli and Lupi 2011), the concentration of firms involves knowledge externalities and, it influences knowledge interactions, it promotes face to face interaction, the observation for imitation, interactive learning and innovation.
Table 47 - Correlations between Innovation and in the Baby Industrial District

<table>
<thead>
<tr>
<th></th>
<th>INN</th>
<th>SCI</th>
<th>KEFROMIK</th>
<th>KEFROMMK</th>
<th>MC</th>
<th>LNRDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>INN</td>
<td>1.000</td>
<td>0.380</td>
<td>0.143</td>
<td>0.136</td>
<td>0.432</td>
<td>0.194</td>
</tr>
<tr>
<td>SCI</td>
<td></td>
<td>1.000</td>
<td>0.729</td>
<td>0.914</td>
<td>0.264</td>
<td>-0.169</td>
</tr>
<tr>
<td>KEFROMIK</td>
<td>0.143</td>
<td>0.729</td>
<td>1.000</td>
<td></td>
<td>0.144</td>
<td>-0.129</td>
</tr>
<tr>
<td>KEFROMMK</td>
<td>0.136</td>
<td>0.676</td>
<td>0.914</td>
<td>1.000</td>
<td>0.151</td>
<td>-0.128</td>
</tr>
<tr>
<td>MC</td>
<td>0.432</td>
<td>0.264</td>
<td>0.144</td>
<td>0.151</td>
<td>1.000</td>
<td>0.432</td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.194</td>
<td>-0.169</td>
<td>-0.129</td>
<td>-0.128</td>
<td>0.432</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 48 - Probit estimates of the likelihood of innovation in Baby industrial district in 2011 with SC1 and LNRDD

<table>
<thead>
<tr>
<th>Estimation Method</th>
<th>Probit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variables</td>
<td>INN</td>
<td></td>
</tr>
<tr>
<td>Coefficient</td>
<td>$\beta$</td>
<td>$z$</td>
</tr>
<tr>
<td>SC1</td>
<td>9.150</td>
<td>3.26</td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.166</td>
<td>1.72*</td>
</tr>
<tr>
<td>cons</td>
<td>-4.759</td>
<td>-2.88</td>
</tr>
<tr>
<td>N. of obs.</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td>0.3029</td>
<td></td>
</tr>
<tr>
<td>Obs. P</td>
<td>0.857</td>
<td></td>
</tr>
<tr>
<td>Pred. P</td>
<td>0.935</td>
<td></td>
</tr>
<tr>
<td>Log pseudolikelihood</td>
<td>-12.007</td>
<td></td>
</tr>
<tr>
<td>Prob&gt;chi2</td>
<td>0.0037</td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>30.01473</td>
<td></td>
</tr>
<tr>
<td>BIC</td>
<td>35.22774</td>
<td></td>
</tr>
<tr>
<td>Correctly classified</td>
<td>90.48%</td>
<td></td>
</tr>
</tbody>
</table>

Estimated by maximum likelihood
*Significant at 10%
*$\partial P/\partial x$ estimated at mean values
Table 49 - Probit estimates of the likelihood of innovation in the Baby industrial district in 2011 with SN, FN, IN, GS and LNRDD

<table>
<thead>
<tr>
<th>Estimation Method</th>
<th>Probit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variables</td>
<td>INN</td>
</tr>
<tr>
<td>Coefficient $\beta$</td>
<td>$z$</td>
</tr>
<tr>
<td>SN</td>
<td>5.816</td>
</tr>
<tr>
<td>FN</td>
<td>0.422</td>
</tr>
<tr>
<td>IN</td>
<td>8.736</td>
</tr>
<tr>
<td>GS</td>
<td>3.834</td>
</tr>
<tr>
<td>LNRDD</td>
<td>0.076</td>
</tr>
<tr>
<td>cons</td>
<td>-7.312</td>
</tr>
</tbody>
</table>

- N. of obs.: 42
- Pseudo $R^2$: 0.4391
- Obs. P: 0.857
- Pred. P: 0.993
- Log pseudolikelihood: -9.661
- Prob $>|\text{chi}2|$: 0.0100
- AIC: 31.3239
- BIC: 41.74992
- Correctly classified: 90.48%

Estimated by maximum likelihood
$\partial P/\partial x$ estimated at mean values

In general considering the results for the Wedding industrial district and for the Baby industrial district, we can confirm that firms of these two districts are characterized by specific features and strategic choice. The first is characterized by a predominance of firm networks, the second by a prevalence of social and institutional networks and a geographical space that influence the innovation. We can also deduce that the most important district Social Capabilities dimensions represented by SN, FN, and GS, balance each other in the Special Industrial district so as to make the relational characteristics of Social Capabilities important and significant for innovation. As already pointed out, however, this depends on the existence of a few pioneer firms and dynamics that are the connection point between the two districts and the main channels through which the tacit knowledge is absorbed, created and spilled over.

The empirical results, we have presented in this section, represent the beginning of our study that should be extended to the entire Apulia fashion district. These results are preliminary and indicative and they are difficult to generalize because of the relative small number of observations.

8.8 Conclusion

The theoretical and empirical analysis carried out in this chapter represents a contribution to the Social Capabilities debate.

We measured, in fact, the Social Capabilities in industrial districts, using the scoreboard approach and we were guided by an OECD Handbook (2008) and by Nardo et al. working paper (2005) for
the construction of the composite indicators. The use of this methodology, derived from Innovation Union Scoreboard (IUS Report, 2011), is due to the difficulty of directly measuring this variable. Through the questionnaire, the elements of the Social Capabilities were implemented and measured in an industrial district, identified in the literature and in the theoretical part, obtaining a series of qualitative and quantitative indicators. The data collection, obtained by interviews, in fact is important for the construction of the composite indicator in the fields of wedding clothing, baby clothing, and Special clothing district.

The linear aggregation is used to measure the SC composite index. It consists of the average value of normalized indicators that we have identified considering the SC characteristics. The SC composite indicator includes 8 indicators that we have normalized with the “Min-Max” method. They are identified as follows:

Geographical Space (GS) determines the spatial conditions (measured by 1 indicator); Social Networks (SN) represents the social conditions (measured by 5 indicators; of these, two in turn are made up of 11 variables); economic conditions, represented by Firm Networks (FN), measured by 4 indicators, and Knowledge Exchange (KE) that is formed by the Knowledge Exchange connected to Innovation Knowledge (KE from IK measured by 8 indicators) and the Knowledge Exchange Connected to Market Knowledge (KE from MK measured by 8 indicators); Institutional Networks (IN) determines political conditions (measured by 4 indicators); Innovation Capabilities (IC) measured by 12 indicators and Marketing Capabilities (MC) measured by 9 indicators.

We have described the results of SC and we have studied its correlations among the other indicators and their diffusion in the wedding, baby and special clothing districts.

We have found that in the wedding clothing district, the composite indicators IC, MC, FN, IN KEfromIK, and KEfromMK are highly positively correlated with the Social Capabilities, in spite of the small or micro sized enterprises. In the baby clothing district, the composite indicators MC, FN, IN, KEfromIK, and KEfromMK are highly positively correlated to the Social Capabilities.

In the wedding clothing district, the main group and equal to 40% is constituted by “moderate” enterprises that exceed 0.30, for the moderate spread of SC within them and within the district and belong to different dimensional classes, but it is poorly related to the size of enterprise. The predominant group in the baby clothing district is instead constituted of so-called “follower” enterprises (73.8%). From this, one can deduce that within the district the dissemination of SC is very high. Since the firms produce different goods, we have distinguished the baby clothing firms into 4 groups considering the academic classification. We have found that, in the external clothing group - which includes firms specializing in the production of outerwear and sportswear, that are
the most innovative firms - on average, the SC value is higher for firms belonging to the knitwear group. This group includes firms that produce pullovers and cardigans and the production can be considered as traditional/fashion.

In the Special clothing district the predominant group is formed by the “follower” firms (51.4%). These firms contribute to the SC dissemination within the district.

Finally the econometric analysis carried out in this chapter is a modest contribution to the debate on the role and the impact that the Social Capabilities considered as an input have on innovation activity of the industrial district. We have highlighted the limits of our econometric analysis because of the used intangible variable, relatively small samples and data that show fairly limited variation by its very nature. We have unpacked the SC index to better investigate which of the SC dimensions are important with respect to district firm innovative activity in this traditional and low tech category. We have found that the most important SC dimensions that we call “SC1” have a significant probability to implement the industrial innovation of the special clothing district as well as of the Baby industrial district. The results are less significant for the Wedding industrial district because in a global context the Marshallian characteristics slowly disappear. We have also found that the SC1 explicative variable is a proxy of firm size and age control variables.

Lastly, it is advisable to specify that the results of this approach, as well as those based on the Scoreboard approach, are “... seriously hampered by a lack of adequate indicators, but we needed new data … to construct more precise and direct indicators” (Hollanders and van Cruysen, 2009, p.26), such as those studied in this work, where SC is a multidimensional phenomenon.

The carried out analysis, at the beginning stage, in fact, shows how the innovation generated by Social Capabilities induces changes in the competitive dynamics of the special industrial district and how the most innovative firms are few, that are the biggest and dynamic oligopolistic firms, often point of union between the wedding and baby clothing districts. These firms are characterized by high flexibility and adaptability to demand for which they are able to create market niches given the specific nature of the product, but they still suffer from international competition.

In a global market also the examined industrial district evolves step by step, it changes its spatial dimension, its social and firm interaction, its source of knowledge, its Social Capabilities and innovation and it adapts to the new challenges that the internationalization process requires.
CHAPTER 9
SYNTHESIS AND CONCLUSIONS

9.1 Introduction

The purpose of this work was: 1) to highlight the key role that knowledge and Social Capabilities play in the transfer and diffusion of tacit knowledge in an industrial district and how this creates new knowledge and innovation; 2) to measure the Social Capabilities within a specific area using the scoreboard approach; and 3) to investigate the effective role that these inputs play stimulating innovative activities in an industrial district performance.

In the theoretical part, the discussion is focused on the knowledge conceptual problem, its different definitions and its various dimensions; on the nature, definition and characteristics of Social Capabilities in the industrial district and on the relationship among knowledge, Social Capabilities and innovation, on the creation and diffusion of knowledge and innovation in the industrial district utilizing Nonaka and Takeuchi’s model.

The empirical aspect is based on original results of surveys carried out on a sample of entrepreneurs in Southern Italy specializing in a special industrial district composed of wedding dresses and baby dresses utilizing a multi-method approach. Each answer is utilized to implement, explain and measure the Social Capabilities. Finally we describe the Social Capabilities diffusion in the case study and we present our empirical analysis estimating an innovation equation.

9.2 Theoretical Aspect in Synthesis

The first step to understand the Social Capability definition in the industrial district is to begin with analysing how knowledge is diffused in an industrial district because the Social Capabilities, in this work, are considered one peculiarity of knowledge to increase the knowledge learning process and network diffusion.

The second step is to give a definition of Social Capabilities in the industrial district starting from the historical origins and their adoption in literature and from the capabilities and dynamic capabilities concept.

The third step is to apply Nonaka and Takeuchi’s model to explain how knowledge and consequently innovation are created and diffused in a modern industrial district.
9.2.1 Knowledge

As we have underlined, the starting point considered in this work is to analyse how knowledge is transferred and diffused in an industrial district and how this creates new knowledge and innovation. This, on one hand, means to recognize the fundamental importance of knowledge in realizing changes in structure, innovation and competitiveness of industrial district in a global market, on the other hand, it means to analyse the different dimensions and the various levels of knowledge from the personal knowledge to the social, organizational, and inter-organizational or district one.

At the same time, it is important to specify that knowledge is a very complex concept to analyze and that a clear definition of knowledge does not exist because it depends on the different point of analysis. For the purpose of this study, we share particularly the Polanyi’s view of knowledge because the tacit and codified dimensions are present both in the individual knowledge and in the social one. Witt and al. (2007) add a third dimension: the <<…non-codified, but, in principle codified knowledge>> that can be acquired through questions to experts and can be transmitted directly with a face to face interaction. As economists we pay attention on the definition, proprieties and role of knowledge in economy, where knowledge is a “strange good” (Foray, 2006, p.91) with ambiguous properties that differ it from the tangible good and from private one because of the social return in the production of knowledge and because it creates knowledge spillovers. These aspects are particularly important in this work, which has stressed the role played by Social Capabilities in an industrial district, where firm competitiveness depends on internal and external sources of knowledge in order to generate new knowledge and all firms benefit from knowledge externalities and knowledge spillovers.

The problem is to understand how the new knowledge that derives from an individual can transform into an organizational knowledge or, in other words, how does personal knowledge become social knowledge and how does firm knowledge become district knowledge?

In fact at the beginning knowledge is individual and personal and requires time, investment and effort, it derives from perceptions, memory, inferences and experience allied with reason (Metcalf and Ramlogan, 2005); or it derives from the subjective “Image” of the world (Boulding, 1956), each person has a different knowledge of the same object and it depends on the conceptual system (Putnam, 1993). Considering that ideas are formed in the mind of individuals and that the development of new ideas derives from interaction among individuals (Nonaka, 1994), we have concluded that personal knowledge can increase with social networks. In other works, with the social networks personal knowledge can be transmitted within a group through interactions to
become social knowledge. These interactions or ties can be strong and/or weak as well as a bridge or a structural hole (Granovetter, 1973; Powell and Grodal 2005; Burt, 1992). In this way, through the social interactions knowledge is shared and developed (Nonaka, 1994).

According to Tsoukas (1996), a firm can be considered a social system or knowledge system through which workers, managers, researchers and so on exchange ideas, opinions, information, experience, knowledge and innovation through internal or external networks with suppliers, buyers, customers, managers, researchers, workers. Other methods to spread the tacit knowledge in the firm is through the learning by doing (Penrose, 1959; Arrow, 1962), learning by using (Rosenberg, 1982), learning by interacting (Lundvall, 1992) and through the tradition (Polanyi, 1962a). In this case we refer to the firm knowledge or organizational knowledge.

At this point we face the problem about how the firm knowledge can spread among the enterprises and become inter-organizational knowledge or district knowledge. To this respect the points of view concerning the possibility of transmitting, or less, knowledge among firms, especially when they refer to tacit dimension, are different. According to Kogut and Zander (1997), Howells (2002), and Barney (1986, 1991), organizational knowledge can be considered a competitive advantage. The implication is that among firms it is information not knowledge that is transferred. Powell and Grodal (2005), Collins and Hitt (2006), on the contrary, think it is possible to transfer the knowledge, also the tacit one, through publications, patents, formal and informal ties, informal networks, trade and goods, among partners that are part of an inter-firm cooperative arrangement or a strategic alliance, research consortia, joint ventures, subcontracts, R&D collaboration, outsourcing agreements.

At this point we have included also the spatial dimension. The traditional spatial concentration, combined with a modern industrial district with the dispersion, influences, in fact, knowledge interactions, knowledge externalities, knowledge sharing and interactive learning and innovation (Krugman, 1991; Howells, 2002; Giuliani, 2005; Boschma and ter Wal, 2007; Cainelli and Lupi, 2011). In other words, a district facilitates social and firm networks, observation for imitation, human resource and workers’ mobility, stimulating transfers of knowledge and innovation, and creation of new knowledge and innovation (Camuffo and Grandinetti, 2006). In this way firm or organizational knowledge is transformed into industrial district or inter-organizational knowledge. But this diffusion and creation depends on the organization absorptive capacity (Giuliani, 2005), on the individual absorptive capacity (Witt and al., 2007) and on the Social Capabilities.
9.2.2 Social Capabilities

We have arrived at the second already mentioned step: the Social Capabilities definition in the industrial district with the definition of the relative characteristics and the key role that Social Capabilities play in the transfer and diffusion of knowledge and tacit knowledge in industrial district for the creation and the diffusion of new knowledge and innovation.

We have started from the capability concept (Richardson 1972; Penrose, 1959, 1985; Foss, 1996; Loasby, 1998a, 1998b) and dynamic capability concept (Teece, Pisano and Shuen, 1997; Leoncini and Montresor, 2008) to arrive at the Social Capabilities. At the same time we have highlighted that if Richardson is the father of the capability concept, Abramovitz is the father of the Social Capabilities and we have described their points of view. But the definition of Social Capabilities adopted in this work is different from the one used by either Abramovitz (1989), or Ohkawa-Rosovsky (1973), or Abramovitz and David (1996). In fact it is integrated with the notions of Marshall (1890), Penrose (1959, 1985) and Bacattini (1981). It is associated with enlarging the knowledge-learning process and network diffusion.

At this point we have identified the characteristics of the Social Capabilities in literature and referred to an industrial district. This identification is very important because the theoretical framework defines the phenomenon that we measure in the empirical part.

At the light of literature (Abramovitz, 1956, 1989; Ohkawa and Rosovsky, 1973; Abramovitz and David, 1996; Marshall, 1981; Becattini 2000, Penrose 1959, 1985) the characteristics and elements of the Social Capabilities in an industrial district include:

- Spatial conditions, where the geographical proximity and/or spatial concentration have to be combined with the dispersion;
- Social conditions, with the tradition, social relationships, skills and ability, knowledge, learning;
- Economic conditions, with the innovation, human resources, organization, knowledge, markets, firm relationships, internationalization;
- Political conditions, with the social and political institutions;
- Innovation with the technological and organizational progress.

But a literature that can help us in defining and measuring them accurately in industrial district is not always available for all the indicators. For this reason we use a questionnaire not only to measure the Social Capabilities, but also to justify their definition and specify the role that they play in innovation.
9.2.3 Knowledge, Social Capabilities and Innovation

Considering that the literature of innovation is very wide (Schumpeter, 1971, 1977; Dussauge et al. 1992; Tushman and O’Reilly, 1997; Hauschildt, 1997; Tether et al., 2005; Utterback and Abernathy, 1975, 1978, Fagerberg, 2005; Thomond and Lettice, 2002; Sirilli, 2010; Arthur, 2009) and that different types of innovations exist, that, in general, we can distinguish them in incremental and radical, material and immaterial ones, we have also considered that the relationship among knowledge, Social Capabilities and innovation not only involved the large firms, but also the SME, and that the essence of technology and innovation is knowledge.

In other words, we have highlighted that the innovation can be seen as the outcome of the process of knowledge creation (Nonaka and Takeuchi, 1995) and at the same time a growth in knowledge is increased by technological change. We have emphasized how a higher level of knowledge and Social Capabilities corresponds to a higher degree of innovation and that innovation depends on the level, the variety and the pervasiveness of knowledge. Consequently, the firm requires constant innovative actions to increase its competitiveness and maintain its market share.

We have, therefore, considered the firm as the centre that governs the knowledge permitting to produce and spread technology and as an organization where the technological knowledge is produced through a learning integration process and formal research. It is for this reason the place of specific competences. Fagerberg (2005) remembers that the firm makes innovation with the combination of knowledge, skills, capabilities and resources.

We have stressed that innovation is to be meant not only as an investment in research and development and in the adoption of new technologies, but, particularly in the SMEs, which do not have a lot of financial resources, it must be meant as the gradual change of types of product, adapting to constant changes in consumer tastes. This gradual innovation consists of implementing new organizational methods both internally – such as CAD or CAM use - and externally in their relationship with other firms– such as the internationalization of some phases of the production process with higher labour intensity- with customers and suppliers (Cappellin, 2010) as well as of creating new types of contract, means of distribution, marketing slogans, new individual ways of working (Tether et al., 2005) and design innovation. To this regard we have distinguished the “Schumpeter Mark I” that regards the SMEs operating in the traditional sectors and it is characterized by high technological opportunities, low appropriability and low cumulativeness, and the “Schumpeter Mark II” which regards large enterprises in advanced sectors that it is characterized by high appropriability and cumulativeness.
We have added also that if innovation depends on the level, the variety and the pervasiveness of knowledge, then effectiveness of innovation and its ability to give monopoly to the firms will be positively proportional to the level of knowledge appropriability, and negatively proportional to the degree of positive externality within the industrial sector, as it happens in the industrial district. In the industrial district, in fact, the accumulation of knowledge and the innovation depend on the low level of knowledge appropriability and on inter firm and social relations. Consequently, within districts, innovation, technical progress and capital accumulation determine a mayor and rapidly increase in performance, productivity and development.

We have also considered as the globalisation process has modified the district borders, therefore the internal knowledge is integrated with the external one. This determines a creation and a diffusion of new knowledge and at the same time an implementation of new firm innovation and of new district innovation. As a consequence the higher is the capacity of absorbing knowledge from outside, the higher are the Social Capabilities, the higher become the transfer and diffusion of knowledge and tacit knowledge in the industrial district and the higher are the creation and diffusion of new knowledge and innovation.

But the problem of the large industrial district literature, both the traditional literature and the evolution one (that is to say it explains the district evolution), is that it does not explain how knowledge transfer happens or changes over time in industrial districts and the theory does not explain how innovation happens too. For this reason we have proposed to apply Nonaka and Takeuchi’s model to the industrial district to fill this gap even if the model used in this way presents different critical aspects.

9.2.4 Nonaka and Takeuchi’s Model

Nonaka and Takeuchi’s model, that is the conceptual approach used in this work, explains how the new knowledge that comes from individuals can be transformed into organizational knowledge though four modes: socialization, externalization, combination and internalization. This organizational knowledge is created when all four modes of knowledge creation interact in a continuous cycle and in a dynamic interaction between the sources of tacit and explicit knowledge. This model is used to explain the process of innovation through the process of organizational creation and in this model the mobilization and conversion of tacit knowledge is the key for the knowledge creation. Through this model which is based on Japanese vision that tends to stress the tacit dimension, where tacit and explicit knowledge are not totally separate, but complementary entities, Nonaka and Takeuchi clarify the unexplained role of tacit knowledge. In fact Nonaka and
Takeuchi even basing on the Polanyi’s work (1966), and, therefore, considering the tacit knowledge personal, context-specific and hard to formalize and communicate, believe that to communicate and share the tacit knowledge in the organization it is necessary to convert it into language, numbers or artefacts. It is during this time that organizational knowledge is created (Nonaka and Takeuchi, 1995, p.9).

It is also interesting to note that if in Nonaka and Takeuchi’s model (1995) the interaction between codified and tacit knowledge is the key of knowledge creation in a firm, for Antonelli (1996, 2008), Metcalfe (1999), Ibrahim et al. (2009) and Casanueva et al. (2013), the combination of codified and tacit knowledge leads to localized knowledge that it is not easy imitable and it is one of the characteristic of an industrial district.

We have also highlighted that if the NTM describes what happens in a single firm, it is difficult to apply it to the industrial district. But we have solved this problem considering the district can be meant as a scattered big firm (Brusco, 1991), that is as a unique and big firm where the organizational knowledge is created through continuous interactions between tacit and explicit knowledge among agents (that in the districts are people and firms).

It is possible then to apply Nonaka and Takeuchi’s model to the industrial district and to the modern one, where knowledge can be caught from the outside (Nonaka and Takeuchi, 1995), shared within the organization, stored in the company knowledge base and utilized in developing new technologies and products (Nonaka and Takeuchi, 1995; Nonaka, 2007). It is a continuous process: from outside to inside to outside again in a form of new product, process and service.

In any case, as already said, notwithstanding a new alternative paradigm does not exist to explain the organizational knowledge dynamics, the NTM presents some limits remarked in literature by Adler, 1995; Essers and Schreinemakers, 1997; Jorna, 1998; Szulanski, 1996, 2000; Bereiter, 2002; Szulanski and Jensen, 2004; Bratianu, 2010; and Gourlay, 2006. In my opinion, moreover, Nonaka and Takeuchi have not considered either the importance of Cohen and Levinthal’s (1989) organization absorptive capabilities or Witt et al.’s (2007) individual “absorptive capacity” on which the knowledge absorbed from outside depends. Furthermore the model does not consider the possibility that the knowledge that the firms hold could be of different degree of tacitness, from the lowest degree to highest one, and that the produced innovations could be of different types, less or more complex. Another of our remarks derives from the observation that in their model Nonaka and Takeuchi forgotten the importance of knowledge spillovers and externalities. In fact, the firm competitiveness depends not only on sources of internal and external knowledge to generate new knowledge, but also on knowledge externalities and knowledge spillovers.
9.3 Empirical Aspects in Synthesis

Before starting with the presentation of the empirical analysis, we have exposed the empirical methodology to identify the sector, the categories and the case study, which are object of our analysis and the economic situation in the time period when we have conducted the analysis.

9.3.1 The Choice of the Case Study

We have chosen to study the garment industry because it is the oldest manufacturing sectors in Italy and Apulia and it represents one of the fields in which Southern Italy has the greater possibilities to compete for quality, design, fashion and innovation.

To identify the Southern Italy areas, sectors, categories and the best companies in the garment industry, we have used different sources of data:

- ISTAT data (2001 and 2011), Istat Report (2005), the National Observatory of the Italian district Report (2013) and the IPI data (2008) to identify the Italian industrial districts number and the Southern Italy areas in the textile (ATECO:13) and clothing (ATECO:14) specialization.
- ISTAT and Yellow Pages and Infoimprese data for the identification of sectors, divisions, categories and areas.
- We compare industry classifications and our academic classification to find the most important categories for product.
- To identify the company name of the most famous companies which operate in the selected categories in Italy we use KOMPASS and Yellow Pages data.

It is important to remember that our academic classification is constructed considering Pavitt’s taxonomy and Peneder’s tripartite classification. It is used because as von Tunzelmann and Acha (2006) say, adopting the conventional industrial classification, the analyst cannot catch the different production techniques for manufacturing processes required to create the final goods that differ from each other both according to the textile fibre used (natural or synthetic fibres) as well as to the quality, design, fashion and innovation, although the final product might appear very similar.

To highlight the relationship existing among knowledge, Social Capabilities and innovation, we chose our sample from within the three categories of clothing sector (classic, innovative and traditional/fashion) at three level of disaggregation (weddings, outdoor clothing, and knit goods).
In the classic category we include the weddings; in the innovative category we include the outdoor clothing and in the traditional/fashion category we consider the knit goods (see Table 7 in Chapter 5).

In short, through this empirical methodology utilized to select the case study, we have identified the areas and product categories. The areas chosen in the Apulia region where in 2010 was formalized the Apulia fashion district, are the southern and northern areas of Bari.

The two cases of specialization in the Apulia region are: the wedding dress district and the baby clothes district that together form a “special industrial district”.

The case of wedding dresses is a good example of classic categories and the province of Bari with its southern area including the town of Putignano produces 60-70% of the wedding dresses that are certified as being “Made in Italy”.

The case of the baby dresses is a good example of innovative and traditional/fashion categories and this case includes the follow categories: hosiery (pullovers), sportswear/outerwear, ceremonial dress. This case includes the southern area of Bari, with the towns of Putignano, Locorotondo, Castellana Grotte, Martina Franca, and the northern area of the Bari basin with Barletta and Andria.

It is important to note that during the period of our empirical investigation (between November 2011 - January 2012) this sector has stagnated and the Italian economy as well as the Apulian one and the Southern Italian have known a slowdown in the GDP growth. The Italian economy, in fact, is in a very delicate phase of the economic cycle, characterized by high firm mortality; fall in employment, firm inefficiency and a reduction in investments for the fifth year in succession. In reality the Italian economy, since 2000, has known significant changes and restructuring due to internal and external events as the 2008 international financial crisis with the repercussion on the real economy and the European sovereign debt crises.

In spite of this context, in 2010, the Regional Law recognized the Fashion District in Apulia. This brings together 247 firms during the year 2010 (Confindustry, 2010) specializing in clothing for men, woman and children, wedding dresses to which universities, associations research centers are to be added.

9.3.2 Empirical Results of the Case Study

As the ISTAT data do not go into detail of the categories we have selected but they contain information on more aggregated data, we have had to use the Infoimprese database of Bari’s
Chamber of Commerce as a source of statistical data and to identify the number and the names of firms. Of the 54 firms selected using this database, 30 from the wedding clothing sector provided valid responses to the questionnaire while in the baby clothing sector of the 123 firms selected we obtained 42 valid questionnaire responses. For the particular period of the investigation it was very difficult to contact and obtain information from the firms. For this reason we used the multi-method approach.

From the results of our original survey (see Chap. 7), and after the description of the general characteristics of producers, we have found in general that even if the firms in the two sectors selected are located in the same area, they differ for class size, performance and strategic choices. As regards the class size, in the wedding dresses, micro-enterprises (1-9 employees) prevail but it is necessary to consider casual and seasonal workers, too, instead in the baby clothing, the firms are from small to medium size and they are more innovative. This reflects the presence of firms characterized by high flexibility and adaptability to demand for which they are able to create market niches. One example of the difference strategic choice is given by the internationalization. If in the wedding dress sector the firms do not relocate their production activities abroad to maintain the high quality of the product, limiting to the marketing or exporting, through the signing of contracts with agents, in the baby dress sector, the firms are very dynamic and the internationalization is not purely commercial, but they have relocated abroad (Albania, China, Thailand and Turkey) some phases of the production process with higher labour intensity. The firms must be able to learn from the different geographical contexts where they operate, to develop appropriate responses or incentives coming from the internationalization process. They reduce the cost of labour and satisfy the consumer who wants to save money due the short life of the dresses for the rapid growth of the child, in contrast to the case of wedding clothing. In this case, for the specific event, the family budget is spent to acquire the wedding dresses for women.

Considering the knowledge sharing in the two districts (Figs. 23 and 35), the carried-out analysis shows that in the two sectors the firms that are direct competitors producing goods that are close substitutes do not cooperate each other, limiting themselves to exchange information about suppliers or distributors to reduce transport costs, while no innovative knowledge or market information is exchanged. In reality this exchange of information about the suppliers is very important particularly in these sectors where the dresses differ with regard to the materials, colors and fashion trends. The intensity of cooperative relationships with suppliers, both local and national, is very important as the relations with the majority of external buyers that are established during happenings, specific exhibitions and with domestic and foreign external customers. Cooperation exists with the local firms that produced complementary goods and, for the only baby
dress sector, with the sub-contractors and with the firms of the Consortium “Baby Italy” where knowledge exchange takes place. It is interesting to note that there are firms that have diversified their production, achieving economies of scope. These firms, in fact, due to the diversification of the asset, producing men, women and children’s ceremonial wear, sometimes extend their production to children ceremonial dresses and firms producing women’s casual and/or classic clothing extend their production to the babywear. For this reason we can consider these firms the “leaders” because they are able to build relationships and enjoy the positive spillovers of both districts, constituting a point of union between the two districts examined (see Fig. 36). The labour mobility for example is important channels of tacit knowledge diffusion not only among the firms of the same districts, but also between the two districts through these firms leader.

At the same time, we have remarked that these districts are modern not only because the existence of social and firm networks, the observation for imitation and human resource mobility, but also because the presence of pioneer firms characterized by a specific innovation capability and internationalization process and because the existence of external resources of knowledge and innovation given to the external relationship.

According to the theoretical part, the mechanism to transfer, create and combine the knowledge in the two modern industrial districts occurs through the social and firm networks; human resources and workers’ mobility and the observation for imitation. Other communication channels are the participation in sectorial fairs and events, in the distribution of catalogues, in the extensive use of the websites and with the informal meeting between the workers and owners, including stylists and designers are preferred to the formal one.

Consequently, if the human resource mobility is a source of tacit knowledge diffusion among firms and it is a source of new knowledge and innovation, the no cooperation actions among the district firms induce an observation of artefacts for imitation. In this way the knowledge inside the artefacts is caught. The artefact in fact embeds tacit and codified knowledge as well as the behaviour of an innovative enterprise. The innovation consists not only of the production of new products - the innovation product is inducted from the demand, but also of the new process that culminates in the purchase of new machinery and the use of CAD or CAM, in order to improve production efficiency. The firms are able to reorganize the international activity. An effort is directed toward the implementation of forms of “evolved innovation “not focused only on innovation of product and/or process, but aimed, as well, at the ICT use.

The firms, nevertheless, underestimate the importance of investments in R&D (it is higher in baby clothing), in human capital, in training, in learning and in the development of both general skills and specific skills as being important in determining district productivity and growth.
At the same time we have verified that the four modes of knowledge conversion of the NTM are present in the two districts. More precisely in these modern industrial districts the knowledge creation is derived from a continuous and dynamic interaction between the internal and external sources of tacit and explicit knowledge.

9.3.3 Measuring the Social Capabilities

We must remember that there are few works that have estimated and measured Social Capabilities and works that have constructed an indicator that measures Social Capabilities in an industrial district are unknown in the literature. We must add that Social Capabilities are usually non-market and non-accounted in regional and national dataset. The only consistent way to identify the characteristics, elements, indicators of Social Capabilities and their related variables is by implementing survey-based approaches.

In this way, we have used each answer of the questionnaire to measure the Social Capabilities adopting the “scoreboard” approach of Hollanders and van Cruysen (2009) and the IUS Report (2011). With this approach the observed phenomenon is measured using a set of main indicators, in our case 8 indicators which catch some of the main elements of the phenomenon. These 8 indicators are identified together with 71 variables. With the help of the Social Capabilities literature and the questionnaire we have identified these Social Capabilities indicators (see Table 19 in Chap. 8).

They are:

- the Geographical Space (GS) for the Spatial conditions;
- the Social Networks (SN) for the Social Conditions;
- the Firm Networks (FN) and Knowledge Exchange (KE) or the Knowledge Exchange connected to Innovation Knowledge (KE from IK) and the Knowledge Exchange Connected to Market Knowledge (KE from MK) for the Economic Condition;
- the Institutional Networks (IN) for the Political Condition;
- the Innovation Capabilities (IC) and Marketing Capabilities (MC) for the Innovation.

To construct the single indicators and the composite indicator to measure the Social Capabilities, we are guided by the OECD Handbook (2008) and we have explained the choice of each indicator.

After the construction of the Social Capabilities index, we have presented the descriptive statistics and the correlation analysis among the Social Capabilities and the other indicators in the wedding
district (see Tables 22 and 23), in the baby clothing district (see Tables 26 and 27) and in the special Clothing district (see Tables 30 and 31).

We have divided at the same time each district in four groups to consider the Social Capabilities diffusion. The groups are: the leader, the follower, the moderate and the modest.

We have found that in the wedding district the predominant group (see Fig. 37) is the moderate (40% of the firms) with a diffusion of Social Capabilities that is from 0.31 to 0.50; in the baby clothing district the predominant group (see Fig. 42) is the follower (51.4% of the firms) with a diffusion of Social Capabilities that is from 0.51 to 0.70; and in the special clothing district the predominant group (see Fig. 47) is the follower (more 73% of the firms) with a diffusion of Social Capabilities that is from 0.51 to 0.70.

At the same time, we have considered the academic classification as highlighted in Chapter 5, and the activity of the sample firms with a diversified production, we have divided the baby clothing activity into 4 groups (Table 29). In the theoretical part we have distinguished three and not four groups, because we have adapted the theoretical classification to the empirical results.

We have noted that in the innovative group, called the external clothing in which the firms produce only sport wear and outerwear, the R&D and Design is conducted in house and with external companies, the technology-intensity process prevails, the workers have high and generic skills. In this group, for the 11.9% of the enterprises, the SC is, on average, equal to 0.52.

Instead in the traditional/fashion group, called knitwear goods in which the firms produce pullovers and cardigans, the Social Capabilities value is the highest and equal to 0.63.

9.3.4 Empirical Results in the Special Clothing District

Following Cainelli, Mancinelli and Mazzanti (2007) a different combination of a simple Probit model was used to test the likelihood that district innovation is influenced by the SC characteristics that we have unpacked in different explicative variables to better understand the results, by the expenditure in R&D and Design and by two control variables (the firm age and size).

The results are that the most representative characteristics of Social Capabilities in the industrial district that catch the social, firm and institutional networks in a geographical space – called SC1 - is significant in the special clothing district as a whole as well as in the Baby clothing district. It is less significant in the wedding district. We have remarked that when SC1 is significant, through these relations, knowledge is absorbed, created and diffused and because of the importance of the marginal effect, the probability to create innovation is high. When we have also unpacked the SC1
variable, we have discovered which of the dimensions prevails in each district. The expenditure in R&D and Design is not significant as it is expected because in these two categories the firms do not have high funds and few firms, the biggest and the youngest ones, make innovation. In fact the SIZE control variable is significant, but its marginal effects are low, instead the AGE control variable is negative. We have also discovered that these two Marshallian district characteristics are not confirmed in a global contest where the modern industrial district operates.

9.4 Conclusions and reflections

We can conclude that the industrial districts that we have studied do not seem to have the characteristics of the cases identified in the traditional literature, but they are modern industrial districts, or, better, using the Markusen classification they have some peculiarities of the traditional district, where the industrial atmosphere of Marshallian memory is missing.

In a modern industrial district open to internationalization, to the new dynamics of the market, the external economies do not depend only on agglomeration and production on one side, society and economy on the other side, as they were inseparable characteristics, but also on the processes of technological innovation and product, which, as already pointed out, can call into question the traditional model of the industrial district.

In the modern district in fact the gradual internalization of the externalization is fundamental, so that the new knowledge and innovation can be created and diffused. This is also made possible thanks to the emergence of leading firms, which often become a strategic necessity to promote change district, reducing their inertia. These leading companies could then become the central node of a district or the point of union among several districts as it happens in our case study.

Considering the Marshallian characteristics present in the examined districts and the different ones, we can highlight the following.

Like the “Marshallian” district the wedding and baby clothing districts are composed of SME; they have low-level economies of scale and key investment decisions are made locally; the raw materials are often originated from outside, are processed within the district for the wedding, are processed also outside the district for the baby clothing, the final product is sold both within and outside; and the local job market is flexibility. Workers in fact move among firms within one district or in any case within two districts – the part-time work is highly prevalent in the wedding – and they are tied to the district rather than to the firm.

Unlike the “Marshallian” districts are characterised by: territorial proximity and not concentration/agglomeration; the use of internationalization and relocation of manufacturing
operations with a higher labour intensity, but it is more prevalent in baby clothing; there are strong
ties within a particular enterprise, while with the other agents internal and external weak ties, driven
by opportunism, are most common; synergy does not exist with institutions; cooperation does not
exist with close competitors.

We can conclude that the Special industrial district can be considered as a big organization that
creates knowledge continuously as it is emphasized in Nonaka and Takeuchi’s spiral. In such a
district it is possible to determine the four modes through which knowledge and innovation are
created.
The socialization that represents one of the most important phases of Nonaka and Takeuchi’s model
is high. In fact in the district the diffusion of tacit knowledge and of Social Capabilities and the
knowledge transfer through interpersonal relationships and in particular through external
relationships are high; the weak ties and strong ties, the job training, informal meetings, interactions
with customers, suppliers, managers and designers and the observation and imitation of directly
competitive firms are high.

The externalization where tacit knowledge becomes explicit in the form of a new product concept is
high because the figurative language, the imagination, the web use and CAD or CAM use is
essential for the firms. So the new product concept is formed through socialization and externalization.

The combination, which is the transfer of explicit to explicit knowledge, is the process of
transforming a concept into a knowledge system with documents, meetings, prototypes. It is high in
the special district and in the wedding and baby clothing districts, all of them can lead to new
knowledge. It involves people interacting and combining knowledge.

The internalization or transformation of knowledge from explicit to tacit, that is associated with
“learning by doing”, and the internalization of experiences into tacit knowledge held by individuals
are very important for the presence of specialized works, in particular in the wedding district, and
for the mobility of employees, even if the expenditure for skills and learning is very limited. In fact,
the firms should invest more, not only in R&D and staff training, but they also pay more attention
to the organizational adopted form which is one of the most important resources that provides a
competitive advantage and which is one of the most valuable resources for both the business and its
customers.
The five conditions to promote organizational knowledge creation and that are the organizational intention with regard to its goals, the autonomy to act, the fluctuation and creative chaos for interactions between the organization and its external environment, the redundancy of information, more than the one needed immediately, and the variety or the organization internal diversity and flexibility, are present in the examined district, even if the diffusion of knowledge, above all the tacit one, often occurs unconsciously.

We believe that in an international context where the traditional district model changes, it would be necessary to reinforce the actions to consolidate the district, enhancing the capacity and specific expertise of production, often artisan, accompanied by the development of brand strategies, technological innovation, internationalization and decentralization of the various production phases, which however, lead, as they have already led, to the closure of many subcontracting businesses. In addition, there is a need for a greater involvement of institutions and organizations in order to strengthen the district and the already-recognized business district set up under the terms of the Regional Government resolution number 1704 dated 19th July 2010 in order to support and enhance the medium- and long-term wealth of knowledge, creativity and Social Capabilities that have supported and aided the appreciation of Apulian products, many of which are “Made in Italy”, around the world.

We believe that firm innovation processes should be stimulated and strengthened by exploiting both tacit and codified knowledge and implementing the Social Capabilities. Firms should be encouraged to form networks, which seem the most appropriate industrial organization model to realize firm integration. Because the Italian production specialization model, particularly in the South, is based on mature sectors, this would seem to be the only way to improve competitiveness. This model reveals one of the limitations of an export-oriented economy. Combining innovation and internationalization - using a system where firms cooperate and integrate to acquire new market share and to strengthen existing share - would be the winning card remembering that the Social Capabilities are the most difficult resources to duplicate for competitors.

We believe that the carried out analyses, both the theoretical and empirical ones, represent a contribution to the Social Capabilities debate. We have proposed a measure of Social Capabilities using a perception index. We know that knowledge and Social Capabilities are the most critical resources and the most difficult variables to measure, but we have accepted this match. The results of the used approach, as well as those based on the Scoreboard approach are hampered by a lack of
adequate indicators and we need new data at national or regional level, to construct more precise and direct indicators because our hope is to extend the empirical investigation to all the Apulian Fashion district as to investigate also the relationship between Social Capabilities and innovation overtime.

Moreover the carried out analysis demonstrates that the Social Capabilities incentive the innovation which derives from the knowledge. This finds one of its primary sources in the external relationships. The external knowledge that is translated into knowledge and technological innovation, being often limited to a single firm or to a few firms, does not induce competitive dynamics through the industrial district. In other words, it would seem that the ability to organize and create the system both locally and internationally is still at an embryonic stage. This deficiency could be overcome if the synergy with the institutions, sought by many of the surveyed firms, were to be realized. To this regard, we believe that if from a theoretical point of view the relations with the institutions are important, this evidence is not clear from an empirical point of view. It is the case when the theoretical approach collides with the empirical ones.
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APPENDIX A: Classification of Economic Activities ATECO 2007 and Number of Local Units and Employment

Classification of economic activities ATECO 2007

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<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>13</td>
<td>Textiles</td>
</tr>
<tr>
<td>13.10.00</td>
<td>Preparation and spinning of textile fibres</td>
</tr>
<tr>
<td>13.20.00</td>
<td>Tessitura Textile weaving</td>
</tr>
<tr>
<td>13.30.00</td>
<td>Finishing of textiles</td>
</tr>
<tr>
<td>13.91.00</td>
<td>Manufacture of knitted and crocheted fabrics</td>
</tr>
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<td>13.92.10</td>
<td>Packaging of bed linen, table linen and furnishing</td>
</tr>
<tr>
<td>13.92.20</td>
<td>Preparation and spinning of textile fibres</td>
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<td>13.93.00</td>
<td>Manufacture of carpets and rugs</td>
</tr>
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<td>13.94.00</td>
<td>Manufacture of cordage, rope, twine and netting</td>
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<td>13.95.00</td>
<td>Manufacture of non-woven and articles thereof (excluding articles of apparel)</td>
</tr>
<tr>
<td>13.96.10</td>
<td>Manufacture of tapes, labels</td>
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<tr>
<td>13.96.20</td>
<td>Manufacture of other technical and industrial textiles</td>
</tr>
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<td>Manufacture of embroidery</td>
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<tr>
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<td>Manufacture of tulle and lace</td>
</tr>
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<td>13.99.90</td>
<td><em>Manufacture of felt and other textiles</em></td>
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<td>14</td>
<td>Wearing apparel; dressing and dyeing of fur</td>
</tr>
<tr>
<td>14.11.00</td>
<td>Manufacture of leather clothes</td>
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<tr>
<td>14.12.00</td>
<td>Pack of gowns, uniforms and other work clothing</td>
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<td>14.13.10</td>
<td>Packaged in sets of outer clothing</td>
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<td>Tailoring and outer wear</td>
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<td>Manufacture of shirt, T-shirt, lingerie and other underwear</td>
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<tr>
<td>14.19.10</td>
<td>Manufacture of other wearing apparel and accessories</td>
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<td>14.19.21</td>
<td>Manufacture of footwear in textile material without soles</td>
</tr>
<tr>
<td>14.19.29</td>
<td>Manufacture of sport wear and others</td>
</tr>
<tr>
<td>14.20.00</td>
<td>Manufacture of articles of fur</td>
</tr>
<tr>
<td>14.31.00</td>
<td>Manufacture of knitted and hosiery</td>
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<tr>
<td>14.39.00</td>
<td>Manufacture of pullover, cardigan and others</td>
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</tr>
<tr>
<td>DEI MOLA DI BARI</td>
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<td>DEI PUTIGNANO</td>
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| Source: Chamber of Commerce, Bari |
Table 2A - Number of local units and employment in textile and clothing sector in Provinces and Apulia (2011) with ATECO 2007

|----------------------------|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|------|----|---
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<th>Polignano a Mare</th>
<th>Putignano</th>
<th>Rutigliano</th>
<th>Ruvo di Puglia</th>
<th>Sammichele di Bari</th>
<th>Sannicandro di Bari</th>
<th>Santenero in Colle</th>
<th>Spinazzola</th>
<th>Terlizzi</th>
<th>Toritto</th>
<th>Trani</th>
<th>Triggiano</th>
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<th>Valenzano</th>
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<td>3.158</td>
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<td>632</td>
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<td>332</td>
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</tbody>
</table>
APPENDIX B: Employees in the Worn Apparel, Dressing and Dyeing of Fur as a Proportion of Total Employment and as a Proportion of the Resident Population in 2001 and 2011

Table 1B - Employees in the worn apparel, dressing and dyeing of fur (18) as a proportion of total employment in 2001

<table>
<thead>
<tr>
<th>Area</th>
<th>Total employed (A)</th>
<th>Employees (B)</th>
<th>B/A %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putignano</td>
<td>7,493</td>
<td>1,253</td>
<td>16.72</td>
</tr>
<tr>
<td>Bari</td>
<td>475,277</td>
<td>13,733</td>
<td>2.89</td>
</tr>
<tr>
<td>Puglia</td>
<td>1,170,913</td>
<td>28,718</td>
<td>2.45</td>
</tr>
<tr>
<td>Centre-north</td>
<td>15,232,898</td>
<td>212,369</td>
<td>1.39</td>
</tr>
<tr>
<td>North-west</td>
<td>6,329,326</td>
<td>67,591</td>
<td>1.07</td>
</tr>
<tr>
<td>North-east</td>
<td>4,664,367</td>
<td>88,997</td>
<td>1.91</td>
</tr>
<tr>
<td>Centre</td>
<td>4,239,205</td>
<td>55,781</td>
<td>1.32</td>
</tr>
<tr>
<td>‘Mezzogiorno’</td>
<td>5,760,834</td>
<td>73,164</td>
<td>1.27</td>
</tr>
<tr>
<td>South</td>
<td>3,942,274</td>
<td>69,141</td>
<td>1.75</td>
</tr>
<tr>
<td>Islands</td>
<td>1,818,560</td>
<td>4,023</td>
<td>0.22</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td><strong>20,993,732</strong></td>
<td><strong>285,533</strong></td>
<td><strong>1.36</strong></td>
</tr>
</tbody>
</table>

Source: our analysis of 2001 ISTAT data

Table 2B- Employees in the worn apparel, dressing and dyeing of fur (18) as a proportion of the resident population in 2001

<table>
<thead>
<tr>
<th>Area</th>
<th>Resident population (A)</th>
<th>Employees (B)</th>
<th>B/A %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putignano</td>
<td>28,140</td>
<td>1,253</td>
<td>4.45</td>
</tr>
<tr>
<td>Bari</td>
<td>316,532</td>
<td>13,733</td>
<td>4.34</td>
</tr>
<tr>
<td>Puglia</td>
<td>4,020,707</td>
<td>28,718</td>
<td>0.71</td>
</tr>
<tr>
<td>Centre-north</td>
<td>36,480,008</td>
<td>212,369</td>
<td>0.58</td>
</tr>
<tr>
<td>North-west</td>
<td>14,938,562</td>
<td>67,591</td>
<td>0.45</td>
</tr>
<tr>
<td>North-east</td>
<td>10,634,820</td>
<td>88,997</td>
<td>0.84</td>
</tr>
<tr>
<td>Centre</td>
<td>10,906,626</td>
<td>55,781</td>
<td>0.51</td>
</tr>
<tr>
<td>‘Mezzogiorno’</td>
<td>20,515,736</td>
<td>73,164</td>
<td>0.36</td>
</tr>
<tr>
<td>South</td>
<td>13,914,865</td>
<td>69,141</td>
<td>0.50</td>
</tr>
<tr>
<td>Islands</td>
<td>6,600,871</td>
<td>4,023</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td><strong>56,995,744</strong></td>
<td><strong>285,533</strong></td>
<td><strong>0.50</strong></td>
</tr>
</tbody>
</table>

Source: our analysis of 2001 ISTAT data

Table 3B - Employees in the worn apparel, dressing and dyeing of fur (14) as a proportion of total employment in 2011

<table>
<thead>
<tr>
<th>Area</th>
<th>Total employed (A)</th>
<th>Employees (B)</th>
<th>B/A %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putignano</td>
<td>11,495</td>
<td>1,642</td>
<td>14.28</td>
</tr>
<tr>
<td>Bari</td>
<td>513,000</td>
<td>14,453</td>
<td>2.81</td>
</tr>
<tr>
<td>Puglia</td>
<td>1,235,000</td>
<td>29,232</td>
<td>2.36</td>
</tr>
</tbody>
</table>

Source: ISTAT, 2012
Table 4B- Employees in the worn apparel, dressing and dyeing of fur (14) as a proportion of the resident population in 2011

<table>
<thead>
<tr>
<th>Area</th>
<th>Resident population (A)</th>
<th>Employees (B)</th>
<th>B/A %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putignano</td>
<td>27,394</td>
<td>1,642</td>
<td>6.00</td>
</tr>
<tr>
<td>Bari</td>
<td>320,475</td>
<td>14,453</td>
<td>4.50</td>
</tr>
<tr>
<td>Puglia</td>
<td>4,091,259</td>
<td>29,232</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Source: ISTAT, 2012
APPENDIX C: Questionnaire

Innovation and Competition in the Textile and Garment Industries of Southern Italy

The information you give will remain strictly confidential. Only aggregate statistical totals will be used in the published results. It would be helpful if responses were as accurate as possible but it is realised that in some cases estimate may have to be used. Such estimates are better than no response at all.

Name of firm or business unit | ____________ | Address | ____________ | Postcode
Name of respondent | ____________ | Job-title/position | ____________

A. General information
A1.a In which of the following activities is your business involved?
- Pullovers (Hosiery)
- Wedding Dresses
- Work wear
- Outerwear

A1.b In which other field of business the company is active?
- None
- Please list: 1) ____________ 2) ____________ 3) ____________

A1.c How many years has this firm been in operation? ........................................

A1.d (i) Is your firm an independent firm? Y N
   (ii) Is it part of a group? Y N
   (iii) Is it predominantly UK owned? Y N
   (iv) Is it predominantly foreign owned? Y N

A2.a Please indicate the ownership of your business
   (Please tick)
- Share capital held by another company
- An independent company
- A majority-owned subsidiary
- A joint venture
- An associate company
- A wholly-owned subsidiary

A2.b If the business is majority or wholly owned subsidiary:
- What is the name of your total company group? ____________
- Location? ____________ Postcode/ZIP ____________

A3 Approximately how many people (Full Time Equivalents – FTE) were employed in your business?
In 2011? ____________ In 2006? ____________ In 2001? ____________

B Research and Development (R&D), Design (D).
B4 Approximately how many people (Full Time Equivalents – FTE) were employed in R&D, D?
In 2011? ____________ In 2006? ____________ In 2001? ____________

B5 Approximately how much is the expenditure for R&D, Design (R&D, D), Learning and Skills?
   R&D, D, T&ES In 2011 £__________,000 In 2006 £__________,000 In 2001 £__________,000
   Learning In 2011 £__________,000 In 2006 £__________,000 In 2001 £__________,000
   Skills In 2011 £__________,000 In 2006 £__________,000 In 2001 £__________,000

B6 Is the design activities (D) conducted in house or with other firms?
- In-house
- Other firms

C Innovation
C7.a Has your firm introduced any significant new products, processes or organizational methods in the recent past?
- new products Y N
- new processes Y N
- demand-driven Y N
- new organizational methods Y N

C7.b How many time per year does the firm develop new prototypes (process or product experiment)?
   1. process experiment (prototype) (from 0 to 10) ____________
   2. product experiment (prototype) (from 0 to 10) ____________

C8 Has the firm introduced CAD or CAM technology (Computer Aided Designer or Computer Aided Manufacturing)?
- Y N

D Marketing
D9 Approximately how much is the expenditure in marketing?
   Marketing In 2011 £__________,000 In 2006 £__________,000 In 2001 £__________,000

D10 Does your firm have a website?
- Y N
   If Yes, does it use its website for marketing? Y N
D11 How does this firm into new market segments? (new market segments consist of new country areas)

Nature of the relationship: [ ] research contract [ ] joint venture [ ] licence [ ] delocalisation
[ ] sub-contract [ ] franchising [ ] other [ ]

E Knowledge exchange

E12 How important are the source information connected to innovation knowledge (IK) (innovation knowledge consists of new materials, more efficient methods of production, new machinery, new techniques, new designing technologies) with:

1. Not important 5. Very important

<table>
<thead>
<tr>
<th>Source Information</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Fairs</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Specialized magazines</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>National and International market</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Formal or informal contacts with other UK firms in same sector</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Formal or informal contacts with other foreign firms in same sector</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Contacts with commercial agents in UK or abroad</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Suppliers</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Clients</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Contacts with associations (like consumer association and other)</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Conference</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Institution</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Association</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

E13 How important are the source information connected to market knowledge (MK) (market knowledge consists of kept information on the consumers' preferences, on the new national and international markets, the latest trends in colors and materials) with:

1. Not important 5. Very important

<table>
<thead>
<tr>
<th>Source Information</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Fairs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Specialized magazines</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>National and International market</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Formal or informal contacts with other UK firms in same sector</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Formal or informal contacts with other foreign firms in same sector</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Contacts with commercial agents in UK or abroad</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Suppliers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Clients</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Contacts with associations (like consumer association and other)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Conference</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Institution</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Association</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

F Social network

F14 Is there common space in the firm?
[ ] Y [ ] N

F15 What is the number of formal and informal meetings in a month among: (formal meeting consists of a workshop, seminar, conference or a meeting keep with previous appointment; informal meeting consists of discussion without appointment, in other words it is an occasional discussion in an office, in a café, restaurant, by phone, in a road and so on).

<table>
<thead>
<tr>
<th>Formal meeting</th>
<th>Informal meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager and customers</td>
<td>0</td>
</tr>
<tr>
<td>Manager and suppliers</td>
<td>0</td>
</tr>
<tr>
<td>Researcher and customers</td>
<td>0</td>
</tr>
<tr>
<td>Manager and manager</td>
<td>0</td>
</tr>
<tr>
<td>Researchers and researchers</td>
<td>0</td>
</tr>
<tr>
<td>Workers and workers</td>
<td>0</td>
</tr>
<tr>
<td>Manager and workers</td>
<td>0</td>
</tr>
<tr>
<td>Researcher and workers</td>
<td>0</td>
</tr>
</tbody>
</table>

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G Conclusion

G16 Is the firm in contact with other firms? (contact consists of an exchange of informations)

☐ Y  ☐ N

If YES, how many are they?

☐ Only 1  ☐ 2-3  ☐ 4-6  ☐ More than 6

Could you describe the firms, the partner’s type and the importance of exchange of information (market issues and / or Technical issues) on contact, please?

<table>
<thead>
<tr>
<th>Firm’s name</th>
<th>Location, e.g. partner, customer,</th>
<th>Partner’s type: Formal (please tick on the number)</th>
<th>Informal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. Not important 2 3 4 5 1 2 3 4 5</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>1 2 3 4 5 1 2 3 4 5</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>1 2 3 4 5 1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

G18a How many suppliers has the firm?

From 1 to 3 ☐  From 4 to 10 ☐  From 11 to 50 ☐  More 50 ☐

G18b How many customers has the firm?

From 1 to 3 ☐  From 4 to 10 ☐  From 11 to 50 ☐  More 50 ☐

G18c. What are the events or exhibitions to which the firm participates?

<table>
<thead>
<tr>
<th>Name</th>
<th>Where is it?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you very much for your cooperation in filling out the questionnaire. Any information you provided will be fully anonymized in research reports or publications.

Annunziata de Felice
APPENDIX D: The Distribution of Indicators in the Wedding District and in the Baby Dresses District

Figure D1 - The distribution of indicators in the wedding district
Figure D2 - The distribution of indicators in the baby dresses district