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**INDUSTRIAL DISTRICT AS A SOURCE OF KNOWLEDGE
CREATION AND REGENERATION**

**THE ROLE OF COMPETENCIES IN THE
BELLUNO EYEWEAR DISTRICT'S GROWTH**

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INTRODUCTION

The concept of the industrial district has been object of several literary works, which have interpreted and analysed the core aspects that define this local system of production. However, an interesting line of research takes its roots in the capacity of the industrial district to operate as a cognitive system, and in this way, create the conditions to grow and innovate. As it is shown in the course of the thesis, the importance that the industrial district has acquired over time as a successful alternative model of industrial organisation originates from its endogenous capability of exploiting the flows of knowledge inside it. These, on their turn, allow the district firms to acquire and improve specific competencies that make the industrial district a context highly competitive and dynamic towards the global economic panorama.

In this regard, the purpose of this paper concerns the interpretation of the industrial district from the knowledge-based perspective. For this reason, in order to comprehend how this local system of production can be considered as a source of knowledge creation and regeneration, the First Chapter underlines the literature interpretations behind the notion of the industrial district. In particular, starting from the core contributions of Alfred Marshall to conclude with the Enzo Rullani's overview, the first part gives a clear framework of how the industrial district has acquired the title of cognitive system that, through its mechanisms of knowledge generation and recreation, is able to feed the process of local innovation. Moreover, in this chapter are underlined the key features of the industrial district, taking into account the most relevant interpretations generated by literature analysis.

In order to have a clear understanding of the correlation between the industrial district and its cognitive interpretation, the Second Chapter is entirely focused on a concrete case study. In particular, the object of examination of this second part concerns the Belluno eyewear district, whose origin and evolution are mainly the result of the creation of an incomparable pool of knowledge and know-how, that has enabled some local firms to have a leading position inside the global eyewear market: one of these is Luxottica, to which is dedicated a brief paragraph that highlights the core aspects of its path of growth and how the Italian firm is related to its place of birth. Consequently, after a detailed analysis concerning the global and national eyewear industry, the growth of the Belluno

eyewear district is examined, emphasising the specific traits which make it a successful model of Italian industrial district. In this regard, particular attention is devoted to the analysis of the variation of combination among the cooperation and competition as well as to the deterioration of the socio-cultural context in the Belluno productive system caused by the processes of internationalisation begun by the local leader firms mainly from the 1990s. Furthermore, following the viewpoint adopted by this thesis, the last section of this second chapter examines the role played by the human capital in the growth of the industrial district firms and the need to continuously improve the pool of competencies and know-how to be competitive. For this reason, this chapter ends emphasising the role of Certottica as the driver for the knowledge development inside the Belluno eyewear district.

The detailed reading of this case study enables to deeply comprehend the importance of the knowledge's mechanisms which regulate the growth of the industrial district. For this reason, the Third Chapter focuses on the analysis of the intra-district flows of knowledge, which allow district firms to enhance their processes of innovation. In detail, starting from an exhaustive explanation of the concept of knowledge and its key aspects, the third part of the thesis is then developed through the interpretation of the industrial district as a cognitive and rational system. On the basis of this theoretical approach, it is clarified in the course of the chapter how the cyclical process of innovation within the local productive system, based on the transfer of knowledge, its absorption and its combination with the stock of knowledge, and lastly on the creation of new knowledge, allows to interpret the industrial district as a local system of innovation. This specific trait, in fact, represents a key factor in increasing the district firms' competitiveness on global value chains. In this regard, the chapter concludes highlighting the effects on the global economic scenarios Covid-19, a respiratory illness deriving from the severe acute respiratory syndrome-related Coronavirus (SARS-CoV-2), that has spread from Wuhan to the rest of the world at the beginning of 2020 could have on global value chains.

The perspective of analysis of this thesis ends in the last Chapter examining in more detail the process of vertical integration adopted by Luxottica in the last part of the 1960s, which has enabled to improve the control of its value chain, and in its turn, enlarge the pool of knowledge owned by the Italian firm to create a product of excellence. The Fourth Chapter, moreover, underlines Luxottica's process of delocalisation in China that, as it is explained in the course of this section, has proved to be a successful strategy, since it has

allowed to both increase Luxottica's production capacity and has favoured the process of import and export of knowledge, in order to constantly innovate and create a product ever more differentiated. On the basis of the considerations proposed in the Third Chapter concerning the effects of the Coronavirus on the global value chains, this part of the thesis ends with the examination of the possible scenarios that the pandemic could generate on Luxottica's value chain.

CHAPTER 1

THEORETICAL ANALYSIS ACCORDING TO THE CONCEPT OF KNOWLEDGE

1.1) Introduction to the chapter

The purpose of this First Chapter is to explain the development of the industrial district concept from the knowledge-based perspective, highlighting how it has acquired the appellation of *cognitive laboratory* over the course of time (Becattini & Rullani, 1993). In particular, it will be explained how the most important scholars, from Marshall to Rullani, have defined the industrial district not only as a system of industrial organisation composed by firms with a lower level of vertical integration compared to large-sized firms, but mainly as a local cognitive system.

Both the concept of industrial district and its cognitive background are profoundly influenced by the economic, historical and cultural events that took place where the local productive system lays its foundations and obtains the support by both local and external actors.

The localisation of similar specialised activities is not only characterised by an intricate relation between firms and society, in which the global and local forces progressively interrelate to outline the welfare of communities and economic returns of firms and countries, but it is as well affected by both setting's conditions and the tendency of local people to accept and collaborate with these systems, favouring the formation and growth of industrial districts. In this regard, the local community is not perceived as a *passive element* (Becattini & Musotti, 2003). In fact, individuals inside the agglomeration area have to operate through policies and initiatives, which inevitably have to be local, favouring the movements of tangible and intangible resources outside and inside the localisation's boundaries. Moreover, an important role is played by the human capital, which represents a significant resource in the creation and transfer of knowledge: the vocational formation of employees is a vital process in the development of a local system of production. For these reasons, increasing our awareness regarding the importance of

the district as a productive system becomes relevant to analyse in more detail when the concept of industrial district takes form until it has configured as a cognitive system.

The background that has built the industrial district consciousness is a process demarcated by a multiplicity of pathways, in which several factors have played a critical role. However, the element which seems the common denominator to the development of industrial districts is a mix of aspects based on the reliance to their own traditional backgrounds and the attraction towards innovation and modernity. Consequently, it is possible to consider the industrial district as a sort of hybrid, defined by the coexistence of these seemingly different features but essential conditions in the evolution of this dynamic system.

The most convenient way to comprehend the idea which configures the industrial district as a cognitive laboratory is “dividing the industrial districts’ concept into two generations of examination, which are characterised by specific social, historical, institutional, organisational, technological and market circumstances” (Brusco S. , 1990, p. 17). In this regard, Brusco identifies the *first generation of industrial districts* (or industrial district *Mark 1*) within the England industrial revolution and in its effects in terms of micro and macro-economic improvements. Whereas, the *second generation of industrial districts* (or industrial district *Mark 2*) is recognised in the re-emergence of the localised models of activities in industrialised and developed countries in correspondence to the second part of the 20th century. A period that opens to the global production and the unceasing development of dense worldwide networks, increasing the importance of the industrial districts. This second generation of industrial districts incorporates some elements of the first one (Mark 1), and it has emerged and established thanks to both the inner characteristics of the first generation as well its ability to include the central role of knowledge spillovers with the local system and regional plans.

Many literary writings have addressed the industrial district concept from various perspectives. They have generated a considerable amount of definitions and examinations in order to frame the key aspects that characterise this local system of production. However, it seems clear that the background emerging from the several analyses of the industrial districts denotes these organisational models of production as one of the most significant *socio-economic* phenomena of the last 40 years, “whose theoretical framework has its roots thanks to Alfred Marshall” (Zaratiegui, 2004, p. 43).

1.2) The Marshallian industrial district

The English industrial revolution, that took place from the 1760s to the 1940s, marks a *bottom-up* and a fundamentally unidirectional industrial path of business development, in which the growth of the first generation of industrial districts (Mark 1) plays an essential and influential role. Within the economic, political and cultural context of England at the end of 19th century takes form the industrial district or manufacturing district phenomenon intended as a generic geographical area where the same kind of industrial or vocational activities are grouped, both within the city or in specific parts of the country (Sforzi, 2008). Consequently, the term industrial district does not have an innovative meaning, but it is merely used as an explanatory form of the agglomeration of industries in England. Only with Alfred Marshall this term assumes a specific meaning, shifting its background of significance to a complex socio-economic concept that describes a particular model of industrial organisation.

As Becattini (1987) highlights in *Mercato e Forze Locali: Il Distretto Industriale*, thanks to Alfred Marshall, “the concept of industrial district assumes a strong territory characterisation and social importance” (p. 47), interpreting it as a valuable object of examination in which specific historical, economic and sociological elements are combined together.

Marshallian theories regarding the industrial agglomerations and the conceptualisation of the industrial district’s idea have contributed to change the economic debate in the second part of the 19th century. The theoretical economic background based on Fordism leads many economists to consider the vertical integration of production processes as the key to drive down costs and favour the division of labour. In contrast, Marshall elaborates a new economic perspective that shows a deep differentiation on several crucial aspects regarding the *Theory of Production* (Groenewegen, 1995). Marshall contests the *factory system*, considered as the foundation of the industrialised and *modern economy* (Taylor, 1842), as the only advantageous and profitable economic system in favour of the production systems geographically agglomerated and characterised by a lower level of integration.

Relevant passages in Marshall’s early works, such as *The Pure Theory of Foreign Trade* (1879) and *The Economics of Industry* (1920) evidence among districts’ features both the great importance of both the division of labour not based on a *centralised control* (Loasby,

1998) and the essential role attributed to the sharing of social capabilities, knowledge and information in the improvement of productive processes towards innovation, preserving at the same time their local productive identity. This different perspective, which shifts the industrial district concept toward a new scenario, is influenced by direct observations of specific localised manufacturing activities and the studies of Charles Ralph Cooke-Taylor (1842), William Edward Hearn (1864) and Herbert Spencer (1862) related to 19th century England economy.

Specific readings support Marshall towards the fortification of his industrial district concept. A typical example of analysis which examines the district phenomenon in England, from which Marshall tries significant theoretical conceptualisations, is recognised in *Plutology: The Theory of the Efforts to Satisfy Human Want*, written by William Edward Hearn and published in 1864.

The author dedicates the Chapter XVII, called “Industrial Organisation”, to the representation and analysis of the agglomeration of industries in London, each one with its trade: specifically, the manufacture of wool, silk, cotton and the iron, cutler and coal industry.

One of the two critical points identified by Hearn is the reason of localisation in a specific area, which results in the *external economies* deriving from the need to reduce production costs: the agglomeration of a specialised industry in the same area makes raw materials easier to obtain. The other one refers to the efficient system of this industrial organisation, “whose advantages derive from its specialisation, a well-organised production process and a systematic division of labour” (Hearn, 1864, p. 305).

Another economist known for his evolutionary ideas is Herbert Spencer, author of the *First Principles*. He focuses on the local industrial organisations of the 19th century in England: the Staffordshire’s pottery manufactures, the cloth districts of York and the concentration of specific professions as bankers and lawyers considered as typical examples of “centres of connection” (Spencer, 1862, p. 255), whose interaction is a natural consequence of social and historical factors.

The key point of this concept, that profoundly influences Marshall, derives from the interpretation of these factors as complex processes of integration and heterogeneity of a *community of people* which simultaneously becomes gradually differentiated in functions and level of powers. Interpreting this differentiation in relation to the local industries, Spencer highlights their essential role in the social and industrial progress: thus, the firms’

aggregation and their degree of specialisation are a direct consequence of the local settlement, socio-cultural factors and historical implications. Spencer's interpretations draw Marshall to frame the industrial district as a case of local industrial organisation defined by many advantages deriving from not only the integration of social components, but also by the differentiation in terms of division of labour and specialisation both in the economic perspective and know-how.

As we can see in *Industry and Trade*, Marshall examines several industrial organisations both in America and England, focusing his analysis on the progress of their production process and the interconnections inside the districts. On one hand, the American scenario in the second half of 19th century is characterised by an increase of the firms' size as a consequence of the political economics focused on the division of labour and standardisation. On the other hand, the industrial agglomerations in England show their distinctiveness in managing different phases of the production process within the same industrial agglomeration, reducing the costs of production and systematically controlling each step to improve its efficiency and preserving the specific outlook of their distinct trades. Many industrial agglomerations in Lancashire, Birmingham, Yorkshire, Sheffield and North Staffordshire, show a considerable development strongly associated with the industrial revolution in the first part of the 20th century.

Alfred Marshall was able to recognise industrial districts as "authentic examples of dynamic models of industrial organisation, combining them with his studies concerning the human mind" (Raffaelli, 2003, p. 53). In particular, this association is explained through what Becattini calls *district anomaly*, the set of ideas that comprises the notion of industrial district, in which the process of evolution of human intellectual skills and competencies is interpreted as the engine that supports the aspects concerning the human sphere of natural history (Becattini, 2004).

Marshall assumes that people evolve and change mostly through working activities and, consequently, they develop in different kinds of social and organisational contexts: a perspective highlighted by the Sheffield district with its long tradition of iron working and the Lancashire textile industrial district. Therefore, in contrast with the dogmatic scholars of the 19th century who, on one hand, are mostly focused on the economies of scale and the factory system as unique models of industrial production and, on the other hand, are not inclined to refuse the *Wage Fund Theory*, Alfred Marshall demonstrates with the

industrial district concept that there is an alternative to the *esosomatic* growth in the productivity: the *endosomatic* productive improvement.

In other words, the concrete instruments owned by labours can be improved by giving attentiveness resources such as knowledge and values, that enhance the competitiveness of the location through which the employee recognises himself. According to these views, Marshall changes the main focus of economic study and research from the esosomatic tools of production (facilities, infrastructures, machineries and so on) devoting his attention to both the human mind and its potential from the intellectual point of view, which is continually focused on innovation and strictly related to the behaviour of each individual. This unconventional position, in contrast with both classical and marginalist economists, creates a gap mainly with Marx's notion on the production system based on capitalism and strictly market mechanisms.

Marshall (1919), in his work *Industry and Trade*, points the attention toward the dynamic behaviour of the English middle-class, which decide to settle in the peripheral areas characterised by "a strong local identity, a spirit of *cooperation* and social integration" (p. 584), to efficiently exploit the opportunities given by the industrial revolution of the 19th century. Marshall interprets this behaviour as a mechanism characterised by the exchange process of competencies, know-how and the widespread knowledge, result of firms' specialisation in different stages of the productive process and innovative ideas existing "in the air" (Whitaker, 1975, p. 197).

According to Marshall, the concept of industrial district is interpreted as an organism in which each part, represented by every firm inside it, deeply interrelate through a combination of *cooperation* and *competition*. On one hand, the competition involves the firms' technological improvements, stimulating the introduction of innovations. On the other one, the cooperation favours the allocation of progress among firms, encourages the sharing of competence inside the organisation model, feeds the right competence flows in the production process and "promotes new product development across functional activities" (Best, 1990, p. 1).

As Taylor (1842) confirms in its *Notes of a Tour in the Manufacturing Districts of Lancashire*, the manufacturing industry has positive influences in both the agglomeration areas in which it is settled and in the adjacent neighbourhood, since "it creates a hub of local specialisation" (p. 140), mainly influenced by the availability of skilled labour, necessary raw materials and ease of communication and transportation. Typical

examples are the cutlery district in Sheffield and the cotton industry in the Lancashire's industrial areas whose development in terms of specialisation and know-how, which are identified as a "synonymous to indicate the success of British industrial revolution" (Wilson & Popp, 2003, p. 92).

Several of the leading dynamic centres, seen as "centres of specialised skills" (Marshall, 1919, p. 115), are identified as unique industrial hubs: Manchester is considered as the first industrial city or "Cotton-opolis", while Sheffield, since the dominance of steel industry in the region, it is recognised as "Steel City" (Evans & Fraser, 2014, p. 35). At the local social level, these realities aliment a sense of pride for the community of people and employees acting in these industrial centres, which works as a driver to consolidate the dynamism set in motion by the industrial revolution.

The complex socio-economic benefits, included in the process of the English industrialisation, improve the level of economic investigations towards a wide range of other sectors such as furniture, clothing households' ornaments and footwear, previously ignored since not oriented to the economic improvement. Nevertheless, these sectors undergo a gradual transformation which is supported by changes in retailing, marketing and market's supply in order to satisfy the new social attitudes of the 20th century (Neil, Brewer, & Plumb, 1982).

During the industrial revolution, many small firms improved their competitive advantage compared to large-sized firms through a flexible specialisation and differentiation of the production phases, creating new opportunities for innovation. Thus, many working capabilities start to focus on the production of a wide range of goods for local customers and foreign trade. In these localities, numerous small-sized, specialised and flexible firms flourish, improving their economic potential through the skilled workforce, manufacturing knowledge, *entrepreneurial spirit* and creating a stable net of interconnections anchored in the area of agglomeration and to other central factors such as family and religion. Consequently, together with manufacturing firms, different kinds of alternative trades grow in numerous new or renewed centres, "gradually creating local and international integrated markets, characterised by a high level of specialisation" (Popp, 2015, p. 24).

These districts amplify Marshall's scenario through which the idea of industrial district is interpreted: from the merely economic analysis focused on the agglomeration of manufacturing activities, whose outcome derives from the naturally developed market

automatism, to the perspective in which socio-cultural and economic factors are combined into “a unique theoretical block to explain the district phenomenon” (Marshall, 1919, p. 599). Marshall identifies in the linkage between these two aspects the core viewpoint of his district’s analysis. In fact, additionally to the phenomenological description of the industrial district shown by the pre-Marshallian economists, Marshall’s theories and studies outline a more complex framework based on the importance of industrial district as an economic and cognitive system. Hence, industrial districts are not purely viewed as local organisational forms that take advantage from the agglomeration of economies, although, as we can see in *Principles of Economics* (Marshall, 1920), the district model is recognised as “a socio-cultural and economic environment of small and medium-sized firms, historically and geographically defined and composed by important mechanisms of interrelation” (Best, 1990, p. 1).

Marshall notes that the combination of competition and cooperation created by the firms agglomerated in the same area leads them to acquire a series of advantages identified as external economies, generated by the intra-district relationships among firms and depending on the positive behaviour of agents inside the industrial district.

The idea at the basis of this concept is that firms, operating inside the industrial district, enjoy a *district effect*. In other words, they take advantage of the external economies which are external to the firms but internal to the district. On the contrary, the firms outside the local agglomeration are not able to exploit the “advantages of external economies generated inside the district” (Becattini, 2000, p. 143).

The benefits deriving from external economies are interpreted as crucial elements for industrial district’s competitive advantage and development. For these reasons, according to Marshall, the industrial districts characterised by several specific branches of industry, efficiently combined among them, represent the most significant model of economic development of the 20th century. In this regard, the cooperation and competition between firms guarantee an efficient level of knowledge flows, which enables the improvement and diffusion of competencies among the actors involved, the spreading of innovative ideas, the enhancement of innovation and new opportunities for growing, hence creating an “organic whole” (Raffaelli, 2003, p. 73) of tangible and intangible resources.

It is clear, therefore, the reference to the industrial atmosphere defined by Alfred Marshall (1919), a concept to underline the positive externalities deriving from the interconnections of local industrial activities enhancing the characteristics of an

industrial district and representing the breeding ground that gives rise and improves its aggregate outcome.

Marshall's interpretation of the idea of industrial district permits us to conclude that this phenomenon takes form and develops thanks to many factors correctly assembled: socio-cultural characteristics, historical features of a localised area, dynamic interconnections among firms, specialisation of the plans within the district, mix of cooperation and competition and linkages that create a net of strong intra-district relations.

The first generation of industrial districts has been typically viewed as an alternative to the development of the factory system in sectors less affected by large-scale organisation and mechanisation. Many current studies have stressed what is already identified by Marshall: the industrial districts of first generation are "seed-beds" (Bellandi & De Propris, 2015, p. 78) of the factory systems, but characterised by an intrinsic and complex social, cultural, historical and organisational dynamism grouped in the same area. However, what can be noticed as the specific aspect of the industrial district is the prevalence of the local source of external economies and knowledge sharing, compared to the transversal production's levels of large firms and their systematic mechanisms of development. This conclusion allows us to introduce the consideration of the industrial district as a complex system of cognitive and economic components.

1.3) From Marshall to Becattini

In the Italian context, the district phenomenon has represented a turning point for many small and medium industrial realities allowing them to face the international panorama and improving the export of *Made in Italy*. However, the awareness of the industrial district's importance as an essential component of the social and economic dynamics has not rapidly established. From an historical point of view, until the end of the 19th, Marshall's theoretical analyses are unheeded because of the persistence of the *Economic Model Theory* focused on large vertically-integrated firms, strongly supported by the economic theories of Frederick Taylor and successively by the concept of Fordism.

For many years, several scholars have identified small firms, mainly based on textile, wood furniture, footwear and leather products, as inadequate to follow the industrialisation process and as forerunners of hypothetical deindustrialisation. However,

in the 1970s, the golden age of mass production displays the first signs of a standstill because of the increase in costs of production and market changes in terms of customers' tastes. Although the shift of goods' demand modifies the competitive panorama, demonstrating how the Fordist-model based on vertically integrated production models is too standardised and inflexible to the new typologies of needs, the flexible specialisation realised by many small and medium firms introduces "a practical alternative to mass production and demand's changes" (Kenney, 2000, p. 200).

In some regions of Italy, like Tuscany, several small manufacturing firms, adequately prepared on the technical level and flexible production, show a strange flourishing, allowing a strong increase of local income, work opportunities and exports of craft goods (Becattini, 1978). The result is a social and income growth that redistributes many benefits and resources to a consistent portion of the middle class who, having reached a higher "standard of comfort" (Wood, 1993, p. 31), begins to require more personalised, high quality and differentiated products and services. Even though the largest firms try to get positive performances facing the problems of the new economic panorama, this does not appear to damage small and medium-sized firms, which, ironically, achieve better results and more competitive advantage.

In this economic panorama, small and medium sized-firms acquire more significance as the "core model of industrial organisation" (Becattini, 2000, p. 23). They have permitted the transformation from the factory system to *workshop* and, in this way, a re-emergence of the focus concerning the *setting of production* that involves both its local community of people and its historical-cultural individuality and uniqueness (Becattini, 2004).

This geographical increasing of local agglomerations is delineated by the sociologist Bagnasco through the publication of *Tre Italie* in 1977 in which he outlines the several social, historical, economic and territorial changes in Italy and their effects in creating new economic contexts. These contexts, called by Bagnasco as *Third Italy*¹ are characterised by a "high density of craft-based small and medium sized-firms, that are agglomerated in a constellation of specialised industrial districts" (Bianchini, 1991, p. 336).

Many researchers, as Becattini and Brusco, base their studies on the relation between the local agglomeration of people and the development of firms operating within it. In fact, mostly from the 1970s, several Italian industrial districts acquire even more market

¹ The term denotes the North-Eastern and Central areas of Italy or NEC regions.

shares due to their international success, relying on the increasing relation between local community and firms.

There are many factors at the basis of these circumstances, which strongly contribute to support the district theories: firstly, this district phenomenon is particularly relevant in Italy since industrial policies, during the second part of the 20th century, do not support large firms. The second reason is related to the entrepreneurial spirit, which mostly defines the Italian industrial context compared to other countries and allows the flow of innovative ideas contributing to the export of *Made in Italy*. Thirdly, focusing on the socio-cultural and historical background, before the First and Second World War, there are small local systems of craft activities which, thanks to the economic boom in the 1950s, have been rapidly transformed into industrial activities. Moreover, especially in Northeast and Centre of Italy, an important point emphasised by Bagnasco and Trigilia is the employees' inclination to become entrepreneurs deeply influenced by the agricultural origins of many workers.

Many researchers start to rediscover the concept of industrial district defined by Marshall as a unit of analysis of the industrial economy and, in particular, as a cognitive paradigm able to explain the Italian social, historical and economic changes that have happened from the 1970s (Becattini, 1979). Consequently, it takes place the concept of Marshallian Industrial Districts, also called "the second generation of industrial districts" (Brusco S. , 1990, p. 17), characterised by many evolutionist and cognitivist theories. These emphasise a more dynamic and consistent interpretation of the industrial district idea and its implication in terms of a valuable model of cognitive environment in the new economic panorama.

From a theoretical point of view, a recent and considerable clarification concerning this second generation of small-scale production is defined by Piore and Sabel (1984), who interpret the re-emergence of manufacturing methods of production and flexible specialisation with the term *second industrial divide*.

Piore and Sabel are the pioneers to comprehend and examine the theoretical background of this changing condition. They offer two interesting and innovative points of view: one aspect relies on the consideration that the mass production is not considered as the unique successful paradigm to have profitable results and neither unproductive model respect to the flexible specialisation. They instead affirm that both these productive models are just two different systems through which production can be organised.

Many nations and countries react to the economic crisis through both models: some of them expand their market share using the mass production, while other countries shift the production processes in the framework of the flexible specialisation model based on solid interrelations among firms and suppliers.

The second aspect, which can be considered as veiled, is that the key characteristics of the industrial district (flexibility and adaptability) should be read as both significant alternatives to mass production, but also as the result of a “tacit” specialisation, which has its natural manifestation in the idea of a local economic system.

Through the *vocational training*, the use of tools, materials and production methods typical of a specific trade turns out to be of second nature. Therefore, it is the practice of individual skills and the mastery of experiences that can reload *new knowledge* to find solutions to unfamiliar problems. In this regard, the industrial district’ *problem solving* is connected to specific instruments of knowledge, both tacit and explicit, that should be improved over time (Piore & Sabel, 1984).

Piore and Sabel have given a significant contribution in creating an international echo regarding this particular topic of studies (Piore M. , 1990). In fact, the districts phenomena have become the central theme of a new wave of researches and studies, acquiring more relevance in the Italian academic interest and international economic environments.

The first Italian economist to take into account the industrial district concept was Giacomo Becattini who followed the basis of analysis provided by the Marshallian studies. What he underlines in his writings is a more extensive viewpoint through which the concept of district described by Marshall is read. As Maurizio Mistri (2006) notes in *Il Distretto Industriale Marshalliano tra Cognizione e Istituzioni*, many elements link the idea of Marshall with that of Becattini.

The two Authors underscore the significant interaction between the local community and the district’s economic environment and identify the cognitive mechanisms inside the industrial district as elements of supporting its evolution. However, while Marshall does not deeply focus on the social component, Giacomo Becattini has the merit to consider it as a vital engine of the industrial district. In 1989, through the publication of *Riflessioni sul Distretto Industriale Marshalliano come Concetto Socio-economico*, the socio-economic component acquired a key role in Becattini’s writings, creating a new wave of many other studies and researches to challenge this aspect and its effects in terms of knowledge flows inside the district.

As highlighted by Becattini, the development of the Italian industrial districts at the beginning of the 1970s until the end of the 1980s, is based on models of industrial specialisation not characterised by important investments in the high-tech sector or in line with large firms' trade. For these reasons, Italian districts are considered as a sort of *economic anomalies* (Becattini, 2004), since only their know-how, complicated to replicate as it is defined by a high level of taste, design and creativity, guarantees the capacity to rise and acquire market shares inside the economic panorama characterised by the dominance of large industrialised firms.

Becattini's object of analysis focuses on the agglomeration areas of Tuscany, in particular, those related to the textile district of Prato and the leather products district of Croce sull'Arno. These are mainly characterised by a high density of small firms deeply connected to each other through not only economic agreements but especially thanks to their social context. Consequently, they are defined by an ongoing knowledge flow and exchange of competencies, favoured by the process of reallocation that incessantly exchanges human resources inside and outside the district.

Becattini underlines the condition related to the survival of these industrial districts based on their strong and stable networks which connect the economic agents inside the districts with their customers and suppliers. The collaboration and coordination of their local activities allow them to produce small differentiated production lots maintaining low-costs and overcome the economic strength of large firms.

As a result, they generate not only an organisational efficient form for the production process but also a *dynamic* socio-economic environment in which every single relation among firms, with its *peculiar timbre* and *character* (Becattini, 1989), is assembled to favour the exchange of skills and ideas and the propensity toward labour and collaboration. Moreover, starting from the 1980s, many *Italian local institutions* begin supporting the small and medium-sized firms with specific financial programs. An example was given by the formation of *Club dei Distretti* in 1994, "one of the major active entity to encourage the growth of the Italian districts" (Ricciardi & Izzo, 2006, p. 82).

From the theoretical perspective, the historical development of industrial districts in Italy, mostly driven by the interrelations among the economic and social systems, leads Becattini to assume a sociological perspective, in which the industrial district is defined as a "socio-economic entity in whose naturally and historically circumscribed area there

is the active presence of both a population of firms and a community of people [...] in which community and firms tend to merge" (Becattini, 1989).

When Becattini cites the term *community of people*, he means a group of individuals characterised by a "belong feeling" (Tappi, 2001, p. 3): the tendency of groups of people living within the district of identifying themselves as a fundamental part of the productive system.

According to the sociological perspective of Becattini, the "belong feeling" concept is not only a prerequisite for the emergence of the industrial district, but it is also marked as a reason of unification among community and firms, which favours the evolution of this productive system over time. For this reason, Becattini's view can be "easily associated with the concept of industrial atmosphere defined by Marshall" (Tappi, 2001, p. 15). Moreover, the community of people notion is defined by a homogeneous system of values, focused on the ethic of work, cooperation, family, change and mutuality. Becattini calls this peculiar type of system of values "chimismi" (Francesconi & Cioccarelli, 2013, p. 40). These values, according to Becattini, develop inside the district, nourishing the individual ethic toward labour, the sharing of knowledge and behaviours of loyalty and cooperation. In particular, Becattini underlines the capacity of the Italian production system to create a strong competitive advantage in the sectors concerned the high level of know-how and design, like footwear and eyewear sector or the wood-furniture industry.

Through the term *population of firms*, Becattini refers to an agglomeration of firms characterised by high flexible specialisation, small and medium sized-firms and high skilled workers, in which the production process is divided into many phases to guarantee an efficient management of resources, working time and firm's improvement.

For this reason, the production chain is interpreted by Becattini as the core of the local productive system in which every firm is considered as a "gear of the industrial district which, connected to the other gears, makes the overall district works efficiently" (Becattini, 2007, p. 134).

In other words. the process of value's creation grows as a result of the productive integration of a series of many specialised and autonomous phases.

The core idea of this interpretation is that an industrial district survives and develops thanks to intra-district relations, characterised by specific stability over time. So, the net of interrelations between the local population of firms and its settlement area assumes a

significant aspect since the interactions between these components promote the acquisition and the sharing of knowledge and know-how.

It is clear how the territory plays a significant role in its industrial district notion. Although it is considered as a sort of “hidden dimension” (Busacca & Costabile, 2018, p. 139), it becomes the panorama through which productive and socio-cultural phenomena intertwine.

The Italian industrial districts are the most significant example of interweaving between the relational process among firms and the *fabric of society*, whose result in terms of district’s evolution depends on different entrepreneurial frameworks and the dynamics through which tangible and intangible resources flow among these two elements. In some cases, the institutional agents serve as catalysts for the growth of districts, stimulating relational flows.

These perspectives of interpretation have to be read taking into consideration the change of attitudes from the 1970s that induces the development of many local small systems of industries across the territory, characterised by flexibility, high level of trustiness and *tacit knowledge* flows focused on product differentiation and operating in traditional and low-tech industries.

In the Italian industrial background, the socio-economic elements spread spontaneously and in different ways, following the culture and historical conditions of their environment of growth.

What favours the expansion of small and medium firms in the 1970s and 1980s concerns the common origin of workers as sharecroppers, whose experience favours the development of a particular type of institution, called “enlarged family” (Tappi, 2001, p. 9).

Two aspects mark the importance of the enlarged family: first of all, it directly favours the acquisition of particular organisation abilities inside the family structure and also the achievement of significant ability of management in terms of working time and income (Bagnasco, 1977).

Secondly, it permits the entrepreneur to reinvest all returns in the firm’s growth, without the necessity to share them through wages. In this way, it is generated a *flexible labour force* defined by skills and inspirations inclined towards the development of small and medium-sized firms (Trigilia, 1992).

To conclude, as highlighted Becattini, the industrial district phenomenon should be analysed on various levels of investigation: first of all, it is important to take into consideration the productive process composed by firms and their human resources whose skill is acquired inside the district.

Secondly, great attention should be devoted to the interactions among the productive process and local markets to guarantee the creation of an economic efficient system: Becattini highlights the necessity to align the prices of local market with those of domestic market without altering the equilibrium among firms. In other words, it is essential to equate the market with customer needs in order to acquire more market share and drive customer' attention towards local products.

As Becattini notes, another important aspect that contributes to the survival of the industrial district is not only the price level of goods but the capacity to continuously create and acquire tacit knowledge, technical know-how and experiences, which thanks to their inimitability assurances to maintain a certain degree of competitive advantage. For this reason, the capacity of a district to renew itself and successfully compete with large firms is mainly related to the conservation of its original technical skills and capabilities and simultaneously adapt them to new manufacturing knowledge and technological advancements.

The last level of analysis concerns the system of values which constitutes the community of people, and that influences the socio-economic behaviour of a district and it serves as the driver for innovation. For this reason, the industrial district concept is interpreted as an ideal model of *localised industry*, characterised by a *local industrial specialisation*, an *organised plurality* of independent elements of decision-making (*de-centralisation*), an essential but not exclusive role played by the local centres of decision-making and strategy involved into the definition of local investments in social, technical and human capital (*endogeneity*) (Becattini & al., 2003).

It is clear, thus, as Becattini decides to frame the industrial district concept according to a sociological definition, which is supported by the relevance of specific cultural, psychological, historical and social perspectives in the emergence of this local productive system. In other words, it is integrated the analysis of industrial district with the consciousness of the importance of social forces and local relationships within the district's structure and development.

1.4) The implications of the *New Economic Geography* by Krugman

From the first part of the 1980s, the renewed interest shown by the economic literature in the analysis of industrial districts has coincided with a new attention toward the geographical localisation as a source of competitive advantage. Consequently, the formation of industrial districts and the presence of *interregional inequalities*, that is, the creation of central and peripheral areas, reinforce the relevance of territorial geography. Starting from these considerations, from the publication of Paul Krugman's work named *Geography and Trade* (1991), a flourishing literature has developed under the banner of *New Economic Geography*. A new line of research to justify the creation and evolution of industrial districts, almost exclusively "relying on external economies linked to the labour market and its conditions" (Krugman, 1997, p. 50), which has contributed to the rediscovery of Marshall's thinking about the effects of scale economies.

In the New Economic Geography is underlined that the improvement of regional industrial concentration and specialisation emphasised by dynamic externalities conducts to regional differences and instability in the long-term: in other words, regional gaps are increased since they are the result of "divergent growth paths" (Alexiadis, 2013, p. 52). This effect conflicts with the models of development based on the *Endogenous Growth Theory*, in which the process of economic integration tends to diminish the differences among the agglomerations.

The model of analysis proposed by the New Economic Geography presents an interesting interpretative approach. It is based on the hypothesis that "the *centripetal forces*² (market-size effects, thick labour markets and pure external economies), which favour the geographical agglomeration, are opposed to the *centrifugal forces* (land rents, immobility in factors of production and pure external diseconomies)" (Krugman, 1998, p. 8) which do not favour the localisation process.

The contraposition between these forces in driving the localisation of firms causes inequalities in the agglomeration processes. Therefore, without considering the hypothesis of convergence shown by the *Neo-classic Economic Theory*, it follows that the territory will not be uniform on its endowments of factors of production but will be diversified in relation to the existence of increasing returns. These can be both internal

² The so-called "Three Classic Marshallian Sources of External Economies".

and/or external to the firm and to the concentration of economic agents which defines the market dimension: these factors are driven to concentrate in regions with higher increasing returns. This context clearly shows “the concept at the basis of what has been termed as *Core-Periphery Model* by Krugman” (Fujita & Thisse, 2009, p. 114) to explain the historical development of several spatial economies, where the industrial activity and population of a country could be geographically clustered in a *core region* (industrially advanced) or a *peripheral* one (less industrially advanced).

The model underlines that, because of the interactions among increasing returns of scale, low level of transportation costs and demand externalities, industrial activities will be localised inside areas characterised by a higher density of people, identified as objectives of the market offer. For this reason, according to Paul Krugman, given sufficiently strong economies of scale, every firm aims to serve the market in a specific localisation, in which there will be a higher level of local demand in order to minimise the transportation costs. Since the local demand will be higher in the regions in which there is a “high level of firms’ distribution” (Krugman, 1991, p. 483), regional development divergences intensify, leading the core regions to improve their economic advantage at the expense of peripheral regions.

The Core-Periphery Model provides a precise description of the documented unbalanced distribution of economic activity of the *American Manufacturing Belt* or the *European Blue Banana*³. In the case of Europe, the expression Blue Banana (Boyer & Brunet, 1989) frames the representation of the economic and monetary integration in Europe occurred in 1992: in particular, the economic integration reduced the obstacles to market inputs, dropping the transportation costs and enhancing economies of scales leading, thus, the fixed cost of operating a factory to increase. Furthermore, the economic improvement led many industrial activities to establish businesses near the most industrialised hubs, contributing to the geographical localisation in these core areas, at the expense of peripheral regions, as represented in the Blue Banana’s geographical localisations. Concerning the field of analysis regarding the Core-Periphery model, it becomes clear how the concept of industrial localisation exposed by Krugman takes its roots from the Marshallian concept of external economies.

³ A banana-shaped discontinuous corridor of urbanisation stretching from Southern Britain down to Northern Italy, passing through Brussels, Amsterdam, Frankfurt and Zurich.

Alfred Marshall (1920) identifies *three-pillar sources* (labour market pooling, input sharing and technological or information spillovers) to clarify the geographical concentration of small and medium firms in the same industry that Krugman reworks to go beyond the outdated language adopted by the English Economist and make these sources up-to-date.

The first source revised by Krugman concerns the access to an efficient *pooled market* for labours which is characterised by a local dimension: the result leads to advantages both for firms and employees, representing an incentive for the firms' localisation and the mobility of workers. In uncertain market conditions, the firms operating in a specific sector are not completely sure of obtaining human capital. For this reason, the localisation in a specific area limits this type of uncertainty since it is characterised by a large pool of workers with different skills and competencies, thus reducing or eliminating formation costs. Furthermore, another external economy resulting from the dynamics of the industrial district is determined by the labour market flexibility, which gives the opportunity to easily vary the "skilled workforce dimension" (Torrise, 2002, p. 59) inside firms.

The employees are inclined to offer their competencies where these competencies are required by firms both because there is a positive correlation among the increasing demand of skilled labour and wage, and because employees can acquire higher market power deriving from the increasing demand for their specialisation.

Regarding the second source, the agglomeration of specific industry inside district creates a demand for "different specialised inputs" (Krugman, 1991, p. 484) that in their turn can create positive effects on other firms' productivity reinforcing, hence, the development of the district.

The geographical proximity with suppliers results of relevance, mostly in the case in which there are high-tech sectors or complex production inputs. In fact, it allows firms to reduce transaction costs resulting from the tacit nature of knowledge and information asymmetries, often tricky to codify and absorb, and it gives the possibility to directly exploit pilot plants or sophisticated instruments. For this reason, to be located inside an industrial district in which many other firms have acquired specific competencies and relations of mutual trust allows them to obtain "many advantages compared to firms operating outside the district" (Folta, Cooper, & Baik, 2006, p. 217).

Widening our perspective and considering the high-tech sectors such as software development or biotechnologies, the interactions among firms represents a crucial factor to favour the localisation: in fact, the geographical proximity permits to reduce research and transaction costs. The advantages resulting from the localisation of similar activities inside the district create external pecuniary economies, which depend on the reduction of the inputs costs, resulting from the demand for these inputs by the firms. These pecuniary economies are considered by Krugman one of the most important forces pushing towards agglomeration.

The third source of external economies concerns technological or information spillovers, that is, the knowledge transferred through merely geographical proximity among the economic agents. It can be linked directly with Marshall's expression "The mysteries of the trade become no mystery, but are, as it were, in the air" (Krugman, 1998, p. 8) that encloses, in short, the concept of industrial atmosphere.

The *Theory of Localisation* indicates that, since geographic proximity is required to transfer knowledge, the knowledge spillovers have a "tendency to be localised within a geographic area" (Karlsson, 2010, p. 72). Hence, the industrial agglomeration favours direct informal *face-to-face* interactions between parties, letting specialised knowledge to be shared among firms and favouring the Hence, the industrial agglomeration favours direct informal *face-to-face* interactions between parties, letting specialised knowledge to be shared among firms and favouring the learning process of this kind of knowledge.

For this reason, the advantage of *spatial proximity*, thus, is that the closeness amplifies the mutual accessibility of all individuals within the district, in this way, enhancing knowledge externalities, defined as technological or information spillovers, accessible to all local members.

Information spillovers become specifically advantageous in market circumstances characterised by quickly changing information such as ideas or when "knowledge has tacit nature" (Karlsson, 2010, p. 42).). For this reason, Krugman voluntarily chooses to place at the third place this kind of externality as source of localisation, since a relevant problem with this kind of knowledge is related to the fact that it is difficult to acquire and improve unless there is a direct comparison with it, inside the palace in which it is shared (Corò, 2006).

As Krugman observes empirical measurements of these spillovers are impossible to be precisely interpreted as opposed to the *codified knowledge*, since "knowledge flows [...]"

are invisible; they leave no paper trail which may be measured and tracked" (1991, p. 53). Hence, the existence and development of agglomeration phenomena can be explained using the three Marshallian' sources.

According to Krugman, in the case in which firms and employees are free to move, they will tend to settle in the same place, in order to exploit these three external economies. In addition to costs externalities, Krugman emphasises the relevance of technological spillovers as factors influencing the localisation decisions: an innovative point of view compared to other studies of industrial district phenomenon.

Nevertheless, Krugman's analysis concerning this last external economy results strongly limitative to the local dimension of these kind of spillovers. What he fails to consider in determining the geography of local development is the primary importance of these "invisible externalities" (Ruggiero, 2005, p. 26).

The context that Krugman explains is, thus, a context in which the degree of labour mobility and transportation costs favour the agglomeration processes among firms: when industrial spatial aggregations are created, they have a tendency to be "self-sustaining" (Han, 2018, p. 13) without the necessity of technological spillovers as determinants of industrial district development. However, as is it possible to notice in the recent geographical literature concerning the process of innovation, the local dimension of knowledge is not only related on traditional experiences, but it is precisely in the productive processes with higher technological content that the borders of experimental processes are enlarging. Consequently, the technological spillovers, in the long term, "denote the most important external economy to favour the localisation, because the dynamic efficiency of production depends on it" (Corò, 2006, p. 16).

1.5) Brusco: formalization of knowledge

What are explained in the last paragraphs are not the only paths pursued by Italian scholars to frame the concept of industrial district: a considerable part of the economic literature is dedicated to the examination and analysis of the structural changes experienced by industrial districts from the first part of the 1970s. Problems concerning this model of industrial organisation are the core aspects of Sebastian Brusco's analysis

during the end of the 20th, that contribute to the research and study mostly of Italian industrial districts.

Sebastiano Brusco develops the notion of industrial district from a conceptual framework linked to Becattini's view but finalised through a different "theoretical matrix" (Brusco, Natali, Russo, & Solinas, 2007, p. 9). Instead of focusing on the social perspective which defines Becattini's district concept, Brusco theorises the notion of industrial district through its impact in terms of historical path and industrial policy.

From the historical viewpoint, Brusco (1990) divides the evolution of industrial districts considering two key periods, that he calls Mark 1 - from 1970 to 1990 - and Mark 2 - from 1990 - (p. 16).

The first phase of the industrial district Mark 1 grows up around the second part of the 1970s, during the period in which many countries and industries strongly raise from the economic point of view: the expansions of textile industry in Carpi and Prato and also the Brianza's furniture industry have high relevance since many Italian products are exported in Europe, acquiring importance outside Italian boundaries.

In this phase, the industrial district concept acquires its framework through what has been described in the *canonical literature*, in which Becattini shifts the unit of analysis from the single firm to a constellation of interconnected small and medium firms located in a specific area.

The empirical researches carried out by Brusco in the 1970s show both the existence of three different kind of small firms - *isolated, operating in a system based on dependent subcontracting and working inside industrial districts* (Brusco & Sabel, 1981) - as well the necessity to identify the most proper policies of development for the different categories and, in particular, for what has been identified as specific local productive system. In fact, from the first part of the 1980s, new marketplaces open towards many challenges to both large and small-sized firms. In this phase, while large firms start a process of restructuring, some small firms inside industrial districts show a kind of strong, *heavy inertia* caused by the low level of government intervention (Brusco S. , 1990).

For this reason, Brusco stresses the necessity to challenge the problems concerning the adaptation on the technological advancement and structural improvement through the correct support provided by institutional and social structures, in order to restore their process of growth. In this regard, Brusco opens to two main concepts about the policies concerning the local systems. One concept is related to the role attributed to *real services*

to sustain firms inside districts, the other one concerns the need of sweeping changes at the level of competencies, sharing of knowledge and social relations. For this reason, Brusco indicates the industrial district as a key objective for industrial policy, since the concept of industrial district represents a model of orientation for local development policies because it allows to find innovative methods to policy intervention and organisation in a more general way.

The industrial policies are examined in many of Brusco's papers, where the central theme is built around the process of training. Through direct policymaking supports and the analyses of local policies promoted by specific institutions are developed training centres to support the systems of firms in the territory and favour the spreading of competencies (Brusco & Bigarelli, 1995). In particular, in a famous essay called *Industrial Districts and Local Economic Regeneration* (Brusco S. , 1992) it is exposed in a systematic way the concept of real services that refers to the services provided by political agencies in Emilia-Romagna to support the local industrial districts from the 1980s.

In line with the Italian debate, Brusco identifies the real services not as those related to financial support but as those that provide "specific services and goods that firms need" (Russo & Natali, 2008, p. 8). In detail, they offer access to information concerning the technical standards for the export of *Made in Italy* products, rules to guarantee the distribution of highly advanced software for the design and production of goods. Moreover, they provide input control that enables to perform market analyses quickly and at affordable costs. In other words, tailor-made information in line with firms' each necessity. For this reason, Brusco underlines the necessity of robust public policies to support these services since the *social fabric* of district may be lacking the competencies required to produce those services or, in the case in which such competencies exist, there may be a limited understanding of their value among small firms: therefore, a weak support in the demand for those services. With the purpose of identifying which services to offer, Brusco emphasises the importance of comprehending the *productive fabric*. In particular, in order to identify the bottlenecks on which to intervene it becomes crucial the understanding of the inter-firm relationships, the analyses of the production chain and the "comparative evaluations with other systems working in similar markets" (Russo & Natali, 2008, p. 11).

The approach of Brusco towards the conceptualisation of industrial policy in the 1990s allows to reconsider the policies for all local systems, starting from the definition of

industrial district as the target of these industrial policies. His definition is profoundly influenced by the intense dialogues with Becattini and his team of researchers, in which the concept of district has always been interpreted not as productive organisation, but as *fully-fledged local societies* (Becattini & Sforzi, 2002).

According to Sebastiano Brusco, these local societies are defined as “a system constituted of three key components: the active firms, the territory on which these firms evolve, and the people living in this territory, with their history and values” (1993). As opposed to the industrial district Mark 1, the small or medium size of firms, the entrepreneurial density and the dominant productive specialisation, in which there are high-level skilled workers, are not necessary conditions to identify the boundaries of a local productive system. Instead, distinctive characteristics for the delimitation of system boundaries are identified in two elements: the very close relations between firms and the relative homogeneity of the socio-cultural system (Brusco S. , 1993).

Starting from the identification of the intertwining between society and economy in the local system, Brusco recognises the local productive system as a unit of planning for industrial policy which has to take into account two central aspects: the first aspect concerns social relations, the other regards knowledge management.

Improving social relations becomes one of the objectives of the industry policy since many literature debates have shown that the success of local system is reinforced by a sense of identity, agreement and a situation of a low level of uncertainty. In particular, Brusco underlines the necessity of industrial policy to take into account both the strategy of each firm and the system of collaboration between economic operators and institutions.

The other element that Brusco underlines is based on the sharing of knowledge, which helps the agents inside the district to quickly identify the opportunity for profit; hence it requires the support of a specific entrepreneurial project. In this view, the objective concerning the socially diffused knowledge leads Brusco to consider as fundamental a drastic reformulation of the project of development for industrial districts, because it becomes essential to integrate culture and history through the direct training of entrepreneurs, employees and experts to correct the inappropriate firms' conditions caused by a weak industrial policy.

An important element of connection with Becattini is the relevance of tacit knowledge as the driver of the industrial district evolution. In particular, Becattini and Rullani (1993) define the tacit knowledge spread in the territory with the term *contextual* or *local*

knowledge, while to the knowledge generated inside large research centres and universities is given the name of *codified* knowledge.

Taking into consideration the distinction between the two types of knowledge, Sebastiano Brusco observes that the industrial district is not only a representative form of an intricate *contextual knowledge*, but also “the box for its continuously renewing through the increasing development of codified knowledge” (Brusco, Natali, Russo, & Solinas, 2007, p. 352). In short, in order to create innovation Brusco idealises two key strategic elements: the first one is the training path, which is formalized, offered and studied in order to fill gaps of the local productive system; the second element is represented by the external firms that, through a *healthy competition*, can share experiences and knowledge to renew those existing.

In the industrial environment, the introduction of new knowledge depends on imitation models of external firms, workforce mobility, spatial proximity in which firms operate, trust relationships, problem solving and processes of incremental knowledge: it is the district itself that with its relations and the adaptation to contingent needs determine the formation of innovation. In this regard, Brusco gives an interesting perspective that partially deviates from the Becattini’s thinking as regards the absence of competitive behaviours inside the industrial district.

The Economist frames the relations between firms as a complex “coexistence of competition and cooperation” (Brusco, Natali, Russo, & Solinas, 2007). In particular, Brusco adds to the conceptualisation of the district another critical factor of success not considered by Becattini: not only the cooperation among the economic agents but also the competition among them. It is essential to underline that this competition is defined by Brusco as a positive aspect, a driver to achieve incremental improvements that are essential to create and maintain the competitive advantage. Therefore, it is consolidated into Brusco’s thinking, thanks to both Becattini’s analysis and his conceptual view of industrial policy, an overview of the industrial district as “node of values, knowledge and institutions [...] strongly anchored in a history, a community, a territory” (Brusco, Natali, Russo, & Solinas, 2007, p. 356). In this perspective, Brusco emphasises the importance of industrial policy which leads Brusco to the interpretation of industrial district as “socio-economic space, defined by the widespread presence of specific technical competencies and business vocation, but also the existence of a complex network of informal rules” (Brusco, Natali, Russo, & Solinas, 2007, p. 23), which governs the relations between

entrepreneurs and workers, adapting and integrating industrial policies to specific necessities.

To conclude, since the 1980s, the contributions of Sebastiano Brusco have enlarged the economic debates about industrial districts and local development: the knowledge dissemination in the territory and the way through which socio-economic relations progressively intertwine with demographic, economic and social phenomena improve the system of relations on a global scale. The local productive dimension, hence, acquires growing importance in strengthening the capacity to enhance social relations and the process of knowledge sharing.

1.6) Distinctive features of the districts: theoretical aspects

Therefore, what are the distinctive characteristics of the districts? What is the basis of their competitive advantage? Is it the district effect?

In the economic literature, many scholars have underlined some key features of industrial districts which have led them to compete both inside and outside the national economic panorama.

One of the main aspects which distinguishes the district phenomenon is the interrelation between firms and community: the geographical agglomeration of firms favours the sharing of common values which improves the sense of belonging to the local community. Thus, it is clear the reference to the accumulation of social capital, strictly linked to the size of agglomeration, to the relations among firms improved by the exchange of technologies, services and information, and also to the competition which stimulates the process of innovation. Moreover, the know-how in some particular sectors is able to reach a high level of advancement as a consequence of the enhancement of craft traditions or as a result of the process of “budding” (Onida, 2004, p. 104) , deriving from the solid experiences developed by pioneering firms. Consequently, inside industrial districts emerge a “constant enrichment of contextual knowledge” (Becattini, 2000, p. 104): the set of non-codified knowledge which develops through firms’ local relations. Another important element of the industrial district is its specific productive specialisation which allows the storage of technical abilities, experiences and learning capacities. This element

enables the creation of an overall knowledge of the product, permitting to exploit opportunities deriving from its technological innovations.

Many of these characteristics are the mirror of Marshallian external economies which allow realising economies of scale inside local agglomerations, reinforced by an ongoing flow of information and local firms' interrelations.

An additional component of these external economies is related to the vocational and technical formation of employees in order to improve their working skills and obtain a dynamic labour mobility: the phenomenon of continuous ranging from one working position to another is subject to the degree of job's opportunities and favours the enlargement of vocational experiences' range and the sharing of knowledge between firms. So, it is important to highlight that, a high level of specialisation, if accompanied by an excessive conservatism of competencies and ideas, could turn into a limit to the industrial district's growth.

The driving force behind innovation also depends on the capacity of the entrepreneur to capture the challenges of markets and transform them into opportunities for development. However, even though there are both numerous productive specialisations and a kind of impermeability towards external environments concerning the recruitment of labour force, the industrial district shows a particular inclination toward the export of its products. In fact, the inclination to a systematic division of labour linked to the productive specialisation creates a surplus of products that imposes the necessity to create stable external networks with social and economic elements outside the district's boundaries. For this reason, in order to have a comprehensive definition of the local system, it is appropriate to take into account also the external elements of interaction. Another relevant factor is the division of labour, which takes place not only inside the industrial district but also through the decomposition of the production process into many phases, so that each firm focusing on a specific sector is devoted to a precise segment of production based on its competencies. This type of working organisation allows a flexibility of the productive offer and, thus, an elasticity regarding the responsiveness to market changes which derives from both the increasingly differentiated demand and the orders from large scale economic operators spread in different countries. Proceeding with this analysis, another key aspect studied in detail by Becattini is related to the combination of cooperation and competition, whose balance permits the growth and the survival of the district. This combination determines two

poles: on one hand, the population of firms, on the other one, the market. These, if taken into consideration together, are defined by Dei Ottati as “the communitarian market” (1991, p. 57). Therefore, the cooperation resulting from the geographical proximity enables the growth of inter-personal relationships: the effect of the local relations feeds the process of knowledge sharing, creating new scenarios for local innovation and business creativity.

All the economic *actors* inside the local system of agglomeration benefit from the positive atmosphere gained from the transfer of new ideas, solutions and production methods, generating an environment of local specialised activities and ensuring the growth of a spirit of entrepreneurial dynamics.

These effects are the key to guarantee an ongoing expansion of the district both in terms of internal and external economies as well as in the capacity of business adaptability. Moreover, the cooperation which underlines the firms' dynamism inside the industrial district is regulated by norms and rules in order to overcome conflicting behaviours: in this way, the reputation of each firm can increase too. For this reason, it is fundamental the existence of a reliable system of institutions and local entities to preserve the market mechanisms in supporting the competition and cooperation processes.

In order to prevent competition from degenerating into a destructive form, local institutions often create price-monitoring systems such as agreed rates which “can be modified according to the specific process of production and that are applied only to those firms which sign this agreement” (Capello, 2015, p. 257).

The district's governance acts preventing cooperation forms from degenerating into financial concentrations or in the emergence of protectionist cartels. Even though most of the district literature underlines the crucial role of cooperation as a source of nourishment for firms' development, the competition among firms obligates them to maintain a “high qualitative standard of products” (Capello, 2015, p. 256).

In conclusion, it is possible to sum up the features above described through the classification made by Bellandi (2003) who examines the most relevant perspectives of literature analyses, principally those of Becattini and Brusco, to create “a canonical form of industrial district” (p. 133). First of all, the industrial district is a place in which the daily experiences of labour, social and family life of a relatively large group of people belonging to a bounded area regularly intersect in the place of agglomeration.

Secondly, the revenue and labour productive activities are realised by the leading firms, with the support of a set of other possible auxiliary and complementary activities, which can be private, public and associative.

Thirdly, these leading firms are managed by economic agents who are operative inside the industrial district. Furthermore, in the main localised productive systems there is a high number of specialised productive areas which operate through processes based on horizontal, vertical and lateral integration.

Lastly, these processes are regulated both on the basis of the local market and on the stable interrelations among firms.

1.7) Industrial district as *hive of knowledge*

The industrial district phenomenon is not only a specific circumstance restricted to just a few sectors and areas, but “it is one of the most widespread expressions of economic growth” (Enright, 2000, p. 6). In fact, the bounded condition of economic growth is not limited to some rare cases, on the contrary, it has emerged mostly in Italy, Spain, Germany, England, embracing both mature industrial sectors and also technological and high-tech ones. It is appropriate to highlight that explaining the industrial district exhaustively is rather tricky, since it is a relatively recent and undoubtedly complex concept. In fact, Giacomo Becattini (1989), considers the industrial district as a “complex methodologically element” whose complexity is based on different types of social and economic elements defined by inextricable relations among each other. However, the characteristic trait which distinguishes it is its capacity to become an integral part of the country’s development, emerging as “a multiplying cognitive process” (Rullani, 2003, p. 65) and positively improving its social and intellectual capital. The key element in this development process relies on the propagation of knowledge and know-how between firms and human resources inside the industrial district, which are “recycled” and multiplied in the local context. Therefore, the territory of agglomeration can be viewed as a pool that contains several forms of competencies which can improve the value of the district. However, the cognitive engine of the district works through many conditions which can be contingent circumstances that could or could not occur, as well as through necessary conditions that favour the diffusion and amplification of knowledge. Hence,

industrial districts' development is characterised by a "sufficient chain of circumstances, not by a sufficient and necessary law of causation" (Rullani, 2003, p. 65). Discovering the engine that creates economic values is essential to understand the processes in which knowledge is generated, shared and used to produce new knowledge. For this reason, the industrial district needs to be conceptualised as a "cognitive system" (Rullani, 2003, p. 72).

In modern economy, the working ability has mostly a cognitive perspective, since it is focused on codifying information, communicating, programming and planning. These activities, classified as intellectual capital (*intangible asset*) and which also include manual job, represent a kind of capital which is vital to create economic value and competitive advantage inside a local productive system. From a broader perspective, local development has to be delineated in terms of competitive advantage resulting from knowledge creation and dissemination, when the activities mentioned above take a localised form.

Knowledge generates an economic value that can be increased through its dissemination or by enlarging its application and regeneration. For this reason, it is possible to compare the district to a *hive*, in which "the single bee (firm) does not need to be wise in every way if knowledge is overall widespread in the hive" (Rullani, 2003, p. 80). However, the important element is not related to the social value that knowledge acquired but the value that each firm obtains from it. The mobility of both knowledge and know-how is determined by a local bottom-up mechanism of propagation opposed to the Fordist mechanism of accumulation, that favours the competitive advantage of the district. Consequently, each firm adds its value to every information received, enlarging the pool of knowledge available and permitting firms to create new knowledge without starting from scratch but exploiting the resources of the other local firms (Rullani, 2003).

The rapid circulation of knowledge among firms is possible thanks to two relevant aspects: the direct and informal interaction based on a common language and the spatial proximity between firms that favours the moving of goods, information and people in a rapid way and at low-cost. In relation to the first aspect, the communication is facilitated by a specific industrial specialisation and a common language that allow to efficiently comprehend the notions that flow in the district, encouraging the formation of new competencies. Concerning the second aspect, the local productive system is able to

improve the propagation of knowledge thanks to the spatial proximity simultaneously controlling its socialisation.

In conclusion, every industrial district has its unique features linked to the place in which it is agglomerated and, most importantly, it has a specific engine which represents its specific identity. This engine is the cognitive structure of the system, which is modified and expanded by the territory of agglomeration or, mostly, by the local society and economy of reference: these three elements are linked thanks to numerous relations and interdependences and influence the management of knowledge flows inside the industrial districts.

CHAPTER 2

THE BELLUNO EYEWEAR DISTRICT AND THE ROLE OF KNOWLEDGE

2.1) Introduction to the chapter

The First Chapter allowed us to understand how, from the knowledge-based perspective, this local productive system is interpreted through numerous literature definitions developed over the course of time. These, however, are all connected by the identification of the industrial district's concept as a context able to capture and transform the intangible assets of the environment in which it has originated and evolved, to create a dynamic cognitive system and favouring the innovation process.

This second part plays an important role in drawing up this thesis, since we directly focus the attention on a concrete case study, before deeply analysing the factors which make the industrial district a cognitive system and examine the mechanisms which regulate its innovation process.

In this regard, the object of study is the Belluno eyewear district with reference to the Luxottica case, that will be analysed in more detail in the Fourth Chapter. The motivation at the basis of this specific choice of analysis is the identification of the Belluno industrial district as “an emblematic example of successful Italian local productive system” (Bonacci, 2007, p. 153), whose determinants of origin and evolution come from two of the most important factors of development of this unique industrial system: the geographical localisation of agglomeration and its manufacturing tradition. Furthermore, despite the market changes occurred in the 1990s caused the reduction of many district realities in Northern Italy, such as in Emilia-Romagna, Veneto and Lombardy, the territorial identity of the Belluno district combined with its *Made in Italy* essence deriving from its high-quality products “have guaranteed its survival and mostly, its affirmation in the national and international panorama” (Schilirò, 2008, p. 18). For this reason, the most appropriate approach of analysis is to start with an economic overview of the eyewear industry and its importance inside the national and international panorama, and then concentrate our point of view on the specific Italian context. In this regard, it will be taken into consideration the first quarter of 2020 in which the effects caused by the Coronavirus's

emergency in the Italian eyewear market have brought it to strongly decrease in terms of imports and exports. In particular, Covid-19, a respiratory illness caused by the severe acute respiratory syndrome-related Coronavirus (SARS-CoV-2), was first reported in Wuhan, in the province of Hubei (China), at the end of December 2019. Since this disease has spread from China to Europe and outside its boundaries, the World Health Organisation (WHT) has categorised it as a pandemic.

2.2) Economic analysis of the eyewear sector

The huge eyewear market is mainly composed by two typologies of segments: the optical frames for sunglasses and glasses and the lenses.

Globally, there are two main zones of production: on one hand, there are South-East Asia and Latin America areas focused on a low-end market, while on the other hand there is the Western area that includes American, European and Japanese producers involved in the production for the medium and high-end eyewear market. In this regard, the segment related to the lenses' production is dominated by Essilor International S.A., a French international ophthalmic optics company involved in the design, manufacturing, and selling of lenses to protect or correct eyesight. In particular, the dominance in this type of market segment led this company to merge with Luxottica Group S.p.A., one of the main leaders in the optical frames sector, creating the new holding company EssilorLuxottica S.A. in 2018.

In addition to Essilor, the German Carl Zeiss AG and the Japanese Hoya Corporation are also relevant.

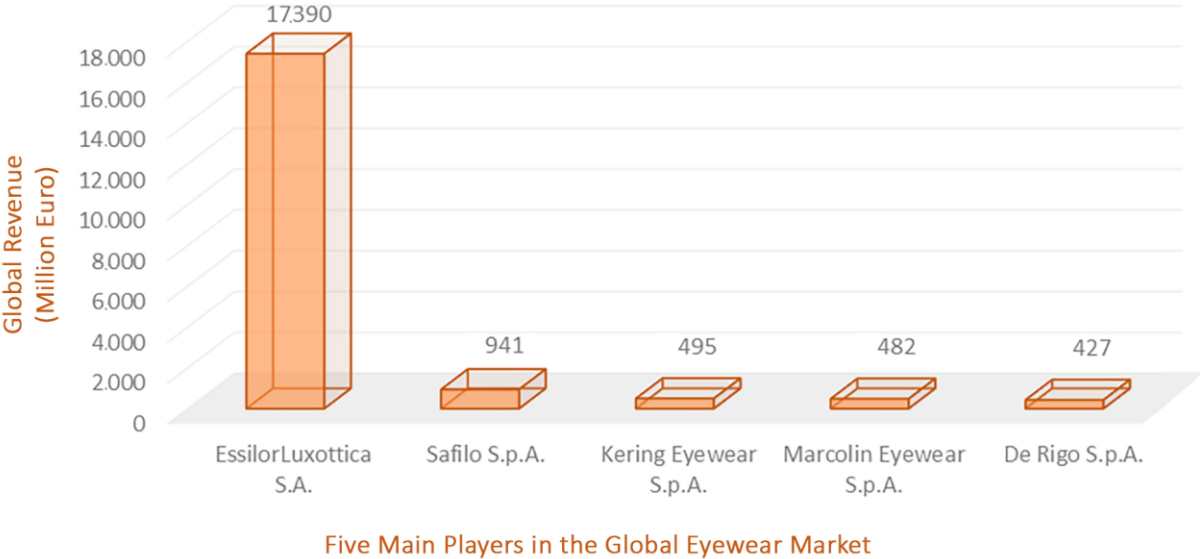
Concerning the optical frames sector, Italian firms play a leading role. As well as Luxottica, there are also Safilo Group S.p.A., De Rigo S.p.A, Marcolin Eyewear S.p.A. which have a considerable market share in this market segment, that also comprises important foreign players such as Marchon Eyewear Inc., LVMH Moët Hennessy-Louis Vuitton SE (known as LVMH Group) and Kering S.A. These last two have taken an important share in the luxury eyewear segment through the vertical integration instead of licensing the brand.

In 2019 the revenue in the eyewear market reached €113.945 million, mainly deriving from the luxury eyewear segment, which produced a revenue of €19.644 million in 2019, showing how it can be considered a dynamic market segment in which eyeglasses are

produced by specialised firms that manage the overall production process, from the design to the production, as well as possessing the licenses to distribute eyeglasses based on the brands' directives. These data, in fact, demonstrate how this sector was on a continuous and stable trend of growth until the effects caused by the Coronavirus's emergency on the global eyewear market, and mostly on the Italian panorama in terms of imports and exports in the first quarter of 2020, as it will be explained more in detail at the end of this paragraph.

As reported in Graph 1 below, in 2019 the dominance of the global eyewear market has been attributed to five key players that, classified in order of revenue, are: EssilorLuxottica S.A., Safilo S.p.A., Kering Eyewear S.p.A., Marcolin Eyewear S.p.A., De Rigo S.p.A. (Da Rolt, 2020).

Graph 1: Revenue, expressed in million euro, of the five main players in the global eyewear market in 2019



Source: Da Rolt, 2020

Even though Luxottica has now created a vertically integrated multinational corporation with Essilor, it is acknowledged that until 2018 four of the six leading players in the eyewear market have been Italian, whose origin and development have taken roots inside the Belluno eyewear district. In fact, the Italian eyewear sector is recognised worldwide for the design and quality of its products, and the ability to provide the perfect conditions for the creation of products of excellence. For this reason, Italian firms are global leaders in the medium-end and high-end (luxury) eyewear segment: in particular, in 2019 the

exports of this sector have reached about €3.876 million, more than 3,9% compared to 2018 (ANFAO, 2020). The Italian eyewear market continues to be a driving sector for the national economy; in fact, this can be confirmed by the statistics provided by the Italian Chamber of Commerce and ANFAO (acronym of Associazione Nazionale Fabbrianti Articoli Ottici), which, despite the economic slowdown of these last years, underline the enduring growth of this sector.

As shown in Table 2, the Italian economic panorama in 2019 was marked by both weak global commerce conditions and a slowdown in global trade due to ever-growing issues boosted by uncertainties. They were the consequence a general protectionist climate, the effects of Brexit on the economic and political European environment, and the trade tensions among China and the USA, which reflected in the Italian eyewear industry. Although these critical elements, the Italian eyewear market was able to obtain encouraging results in terms of export and revenue in 2019, before suffering the dramatic effects caused by the Coronavirus's emergency in the first part of 2020. In 2019 the Italian eyewear production totalled €3.991 million, which increased of 3,3% between 2018 and 2019, compared to that obtained between 2017 and 2018, which increased only of 1,6% (ANFAO, 2019). These data confirm, hence, the capability that this sector has demonstrated to overcome the general context not favourable to investments. Moreover, also the trade balance of the Italian eyewear industry has shown a positive result (€2.530 million), mirroring a value similar to that of 2018, but indicating to be in surplus contrary to the expectations at the beginning of 2019. In detail, on one hand, exports of sunglasses, frames and lenses, which account for 80% of the entire production and represent the core element of the eyewear industry, highly increased by 3,9% generating a total of €3.876 million, on the other hand, imports increased by €1.346 million (6,7%), confirming thus, the liveliness of this sector and the crucial role of the Italian eyewear's quality and design in customers' needs. In this regard, in 2019 the Asian market continued to be the primary one for imports, with a market's share of 75%, almost exclusively concentrated in East Asia (ANFAO, 2020).


Analysing more deeply the exports of the Italian eyewear industry, in 2019 these accounted for about 103 million pairs of eyeglasses, which comprised 66 million of sunglasses (64%) and 37 million of optical frames (36%): a result which mirrors the growing trend of 2018.

The main markets for exports continued to be Europe and America, which respectively comprised €1.891,1 million (48,7%) and €1.297,9 million (33,1%) of the total exports in 2019, both characterised by a growth trend respectively of 2,2% in Europe and 6,7% in America compared to 2018 (Table 1).

In Europe the main countries for exports were France and Germany, which accounted for €429,8 million and €244,2 million respectively.

Considering the exports in America, while in North America the exports' recovery and growth were exclusively attributable to sunglasses, the frames segment played a key role in Central and South America (ANFAO, 2020). Moreover, the Asian market has acquired great relevance, as it represented €612,9 million (16,2%) of Italian frames and sunglasses' exports.

Table 1: Main markets for the Italian eyewear export of frames and sunglasses in the 2019 and comparison with 2018's percentage of exports

Main Markets	Value and Market Share	
AFRICA	1,5% €58,3 ml	+4,5%
ASIA	16,2% €612,9 ml	+3,4%
AMERICA	33,1% €1.297,9 ml	+6,7%
EUROPE	48,7% €1.891,1 ml	+2,2%
OCEANIA	0,4% €16,6 ml	-14,5%

Source: ANFAO, 2020

From the domestic market's perspective (Table 2), 2019 has been characterised by a setback. In fact, for the second consecutive year, the value of sales showed a decline of 0,2% compared to that of 2018, accounting for "only" € 982 million, especially because of the decline in the optical frames and sunglasses segments.

Table 2: Details of the Italian eyewear industry in terms of production value (output), imports, exports and domestic market from 2016 to 2019

	2016		2017		2018		2019	
	Million Euro	Var. %	Million Euro	Var. %	Million Euro	Var. %	Million Euro	Var. %
Production Value (Output)	3.697	3,7%	3.804	2,9%	3.865	1,6%	3.991	3,3%
Exports	3.579	3,6%	3.698	2,3%	3.732	0,9%	3.876	3,9%
Imports	1.183	3,3%	1.224	2,4%	1.261	3,1%	1.346	6,7%
Domestic Market	1.007	2,2%	994	-1,2%	984	-1,0%	982	-0,2%

Source: ANFAO, 2020

As it was underlined in this paragraph, the first quarter of 2020 was characterised by a dramatic scenario in which the effects of the Coronavirus in Italy have led almost all the economic activities to shut down until the second part of May thanks to the Governmental Decree of 17th May 2020. In this regard, the spread of the pandemic from China to the rest of the world from the beginning of January 2020 created a rapid closure of all the Asian markets and, successively, a global lockdown of the economic activities. The consequences of these manoeuvres have brought the Italian eyewear market to extremely suffer the impossibility of exporting with the major markets of reference in Asia (China, Hong Kong, Macao and Taiwan) which represent about 7,7% of exports of the Italian eyewear industry, and successively with the markets in North America and Europe. In fact, taking into consideration the data provided by ANFAO (2020) in relation to the first quarter of 2020, the exports registered were of €805 million with a decrease by 17,6% (approximately €200 million) compared to the first quarter of 2019. In particular, this huge drop of exports was attributed to both the closure of the main markets of reference in Europe, America and Asia and, mainly, the postponement in 2021 of the main international trade fair event, MIDO, for the Italian eyewear companies. On the other hand, even the imports of raw materials and semi-finished products have suffered an

important drop mainly in March 2020. In this regard, the first quarter of 2020 showed a decline of imports of €239 million (-13%) compared to those registered in 2019. These data, in fact, allow to comprehend the significant decline of sell-out by about 33% in May 2020, which was also affected by the impossibility of fulfilling orders, the postponement or annulment of strategic trade partnerships, and cancellations of orders. For these reasons, taking into account the consequences generated by the Coronavirus on the Italian eyewear market, the forecasts regarding the exports of the sector estimate a loss of approximately €1.000 million at the end of 2020 (ANFAO, 2020).

Although in these last years the data just analysed have not framed a brilliant scenario for this sector, especially because it has been extremely hit by the effects of the Coronavirus on the global economies, the Italian eyewear manufacturing has proven to be still competitive in the global panorama, reinforced by the ability to create a wide range of products defined by high quality and innovative design, in line with the market's changes and customers' needs.

The considerable relevance that the Italian eyewear sector has acquired over the course of time is strictly related to the territory of agglomeration in which the Italian leading firms have developed, generating undisputed levels of know-how and knowledge that have become the core of the Italian eyewear's success.

It is essential to underline that, referring to the Italian eyewear industry means discussing about the Belluno eyewear district, where this industry has originated and has been transformed, covering in 2019 about 80% of the total national production (CCIAA Treviso-Belluno, 2019).

The Belluno area has proven to be a fertile basin for the development of the main eyewear firms, mainly for Luxottica, and for this reason it is essential to address how it has originated and evolved in the course of time in the next paragraph.

2.3) Origin and transformations of the Belluno eyewear district

In Italy there are about 200 industrial districts (Boito, 2020). They differ in their production peculiarities and geographical location. In particular, the North-Est area of Italy is considered the most representative part of the Italian industrial district model, since it is characterised by a dense constellation of small and medium-sized firms, about

27% of the national total registered in the first semester of 2019 (MondoPMI, 2019), highly specialised in furniture industry, fashion or food sectors.

As previously mentioned, interesting is the case of the Belluno eyewear district which, although it is far from the “long history of many Italian districts which are defined by an ancient manufacturing tradition widespread in the territory” (Corò & Grandinetti, 2001, p. 137), it has been able to create an incomparable pool of competencies and know-how, such as to lead Italian firms to dominate the global eyewear market.

The beginning of this local productive system and its peculiarities are connected with the territory of agglomeration, that is located in Calalzo di Cadore, in the province of Belluno in Veneto. In particular, two key factors are relevant in the birth of the Belluno industrial district: the abundance of productive resources and the concentration of a high level of tacit knowledge.

The first factor was an essential element for the localisation of the first eyewear establishments: the area is characterised by numerous waterways which guarantee hydropower, a fundamental resource that at the end of the 1800s was transformed into electric energy in order to power up the production’s machineries.

The second factor is related to the high skills and capabilities shown by the community of people in manufacturing production. In this regard, even if the Cadore area offered a low-cost workforce, it was characterised by a strong know-how in the manufacturing production and an inclination to constantly improve its productive competencies.

It is important to highlight that, on one hand, this factor was partially conditioned by the territorial conformation of Belluno, which did not permit to specialise in mountain agriculture and carpentry. Whereas, on the other hand, the know-how possessed by Cadore's workers was influenced by the manufacturing art brought by many apprentices, who previously worked in the Venetian craft shops in which the eyewear was born in the 13th century until their disappearance at the end of the 18th century.

From a historical perspective, the roots of this industrial district took place in 1878 with the first settlement of a small glasses' laboratory in Calalzo di Cadore thanks to the partnership among Angelo Frescura and Giovanni Lozza.

The initial conditions of production were favourable since they were dictated by numerous commissions concerning the assembly of some glasses' parts. Even though the death of Angelo Frescura led Carlo Enrico Ferrari to take over the business in 1887, this change of leadership brought this manufacturing activity to a considerable improvement,

favouring the process of "distrettualisation". In fact, the range of production increased including every typology of lens, eyeglass and sunglass frames, small items, glass cases and specific types of production's machinery (Confindustria Belluno Dolomiti, 2010).

From the qualitative perspective, the growing process of innovation and the increasing demand, deriving from both internal and external Italian boundaries, were combined with a low-cost but extremely specialised workforce such as to generate artefacts with an excellent price-quality ratio. Successively, the manufacturing activity was held by the eyewear's pioneers Cattaneo and Ulisse Cargnel, who expanded the establishment with the introduction of the celluloid's production, in order to enlarge the range of spectacle frames' typologies.

In 1934, thanks to Guglielmo Tabacchi, Safilo (acronym of *Società Anonima Fabbrica Italiana Lavorazione Occhiali*) was born, the first Italian production site involved in the eyewear industry. This local productive system was not an isolated case, in fact, the capillary diffusion of small eyewear productive sites had already begun in the first part of the 1920s thanks to the first *spin-offs* of new firms as a result of the increasing number of highly skilled manufacturers in the Cadore area, mostly trained by Enrico Ferrari and Ulisse Cargnel. In this regard, two cases are relevant: the first firm of eyewear focused on the creation of a product made of celluloid, which was founded by Lozza brothers in 1919; and the firm of Giorgio Fedon in Vallesella di Cadore (now called Giorgio Fedon & Figli S.p.A.). This was initially born as a small laboratory dedicated to the production of spectacle cases and today is an Italian firm also operating in the leather goods industry and the production of travel accessories.

The transformation of Belluno local productive system into a concrete eyewear industrial reality took place with both the capillary dissemination of small manufacturing activities mostly during the 1940s and 1950s (for example the birth of F.I.L.O.S. in Segusino and small-sized subcontractors' firms spread in all areas of Cadore), but also with the introduction of the optician profession in the State Professional Institute for Industry and Crafts in Pieve di Cadore, the oldest high school in Cadore, which expanded with laboratories and dedicated classrooms. Furthermore, the formation of a solid district environment was also supported by the creation of Luxottica, founded by Leonardo Del Vecchio in 1961 and located in Agordo. Initially, Luxottica was a small firm involved in the production of spectacle parts on behalf of third parties and characterised by a limited partnership between Leonardo Del Vecchio, one of the founding partners, and the owners

of Metalflex in Venas di Cadore, financiers of Luxottica. However, from 1967, thanks to the ongoing product innovations and the increasing demand for spectacle frames, Del Vecchio began to fabricate complete eyeglass frames under the Luxottica brand, ending the contract manufacturing business with the two owners of Metalflex and starting the legendary course of the world's largest company in the eyewear industry (Castelli, 2014). The same year in which Luxottica was founded, Giovanni Coffen Marcolin founded another important eyewear company that reinforced the district context in Belluno: together with Luxottica and Safilo, represented one of the major industrial poles of Belluno area. However, only at the beginning of the 1970s “were consolidated all the typical characteristics of an industrial district environment” (Bramanti & Gambarotto, 2008, p. 28). The number of employees exceeded that of firms, and it was created a deep net of interrelations and cooperation among these firms, which exploited the spatial proximity and firms’ specialisation. Consequently, from the first part of the 1960s onwards, two manufacturing clusters could be visibly recognised in the province of Belluno.

The first one is represented by the small and medium-sized firms in the Cadore area, focusing in single stages of the production process and therefore strongly interdependent; the second one, in the Agordino valley, can be identified as another smaller firms’ group, that had grown up around Luxottica.

The “distrettualisation” process that the area of Belluno was experiencing in those years positively affected the employment. As it is possible to see in Graph 2, which shows the quantitative changes in the Belluno eyewear district from 1971, in terms of both firms and employees, the number of workforces shifted from 2600 in 1971 to 4268 ten years later, rising to 11.141 in 2001. These data are also confirmed by the improvement of local productive systems which increased from 137 in 1971 to 646 in 2001 confirming, hence, the change of direction of the eyewear district, that in the first part of the 1970s “had already started to expand outside the core area of agglomeration” (Bramanti & Gambarotto, 2008, pp. 26-27). A significant example was the foundation of De Rigo in the 1978 by the brothers Walter and Ennio De Rigo in Pozzale di Cador, Longarone, in addition to other productive structures spread in Veneto.

The continuous evolution shown by the Belluno industrial district has been a direct consequence of many factors. One of them is the consolidation of the four leading firms (Luxottica, Safilo, De Rigo and Marcolin) that, thanks to their inclination to continuously

innovate themselves, were able to reinforce the competitive strength of the district, taking advantage of the local entrepreneurial dynamism. In fact, between *leader firms* and smaller ones was created a cooperation that, on one hand, allowed small firms to acquire specific competencies, hence, facilitating their subcontracting relations and favouring potential spin-off mechanisms of new firms, on the other hand, leader firms, tendering the production of some components of the glasses, had the opportunity to concentrate on international markets. The expansion continued until the end of the 1980s. In fact, in the first part of the 1990s, the spin-off mechanism was affected by a deep slowdown which led to the end of the district “gemination” process. However, this did not negatively affect the employment level, which will come to a stop only in the second part of the 1990s (Graph 2). In these years, since the increased intensity of international competition, mostly from the East-Asian producers, the productive capacity focused on the four leader firms and few medium-sized firms leading, thus, the workforce to concentrate around the areas of major production, causing a decreasing of firms’ number outside these areas but the improvement of employment (Graph 2).

The kind of development that has affected this industrial district since the last part of the 1980s enabled the Belluno district to reach a new path of growth until the second part of the 1990s. It was not only related to the flexible production, an excellent quality-price ratio and the wide range of eyeglasses’ varieties, both modern and traditional models, but the key factor was the change of perspective towards the eyewear: if before they were considered mere instruments to correct eyesight defects, they were now becoming a fashion accessory. In this regard, the district transformed its productive system, mainly based on mass production, into a more dynamic productive system, built on the flexible specialisation in which the design and the artefact’s prototype have become fundamental elements for the firm’s success. From this perspective, the production of sunglasses, and in particular of designer sunglasses, has been the core element in the new evolutionary trajectory of the Belluno eyewear district. Even if the eyewear’s conceptualisation as a fashion accessory has resized the productive cycle, it has opened the way towards the product differentiation in which the role of brands has overshadowed the manufacturing site’s importance. Consequently, the Italian eyewear market opened to the fashion industry, creating numerous partnerships with the most important brands in the international panorama, such as Valentino, Dolce & Gabbana and Giorgio Armani (for example the license agreement among Luxottica and Armani in 1988), and consequently

internationalising the eyewear produced by the Belluno district, but at the same time maintaining the quality and the value of the *Made in Italy*. Furthermore, it is not a coincidence that many local services called Knowledge Intensive Business Services (KIBS) have developed in these years. They provide knowledge-intensive sustenance for the firms' business processes, mostly related to legal, design, training and marketing services. Among these, inside the Belluno industrial district a key role is played by Certottica. It was born in 1992, and it is the Italian institute for the optical products' certification that, thanks to its continuous research and development, training, standardisation and certification activities, today is the global leader in the release of face and eye protection devices' certification. Moreover, since it has acquired a substantial role inside the district, it also promotes and improves the development of the Belluno local system through the collaboration with many local firms and institutional actors, offering services concerning the firm's advancement and the training of human capital, of which the dynamics inside Certottica will be explained in this chapter.

The 1990s opened to the internationalisation of the district that marked a break with the traditional district development. In particular, the beginning of the 1990s showed a dizzying increase of the eyewear demand and supply.

The first one was boosted by the devaluation of Lira (1993-1994), while the second one was supported by the flexible specialisation of the productive process, which was able to satisfy new customers, both national and international, through a wide range of spectacles' models characterised by high quality, but offered at a lower price compared to market rivals.

The dynamism deriving from the intensifications of demand caused, however, an oversizing of the productive capacity, such as to lead large firms to exploit many small and medium-sized subcontractors that, in this phase of market openness, were exponentially increased. Although on one hand these firms proved to be functional in the absorption of large firms' demand, on the other hand, they represented a critical element in case of market stability or crisis, since characterised by both low inclination to collaboration and lack of adaptation. In fact, during the most important stages of development, many small and medium-sized firms were strongly supported by significant associations: one of the most ancient and relevant is ANFAO, established in 1954 in Milan, with the aim to strengthen the relations between firms inside the district and to represent their interests abroad.

The small and medium firms have been the main actors in supporting the development of Belluno district until 1995, the year in which the eyewear sectoral growth was affected by a standstill in the eyewear demand, that led to a resizing of the numerous subcontractors “which decreased among the 1997 and 2007 by almost half (from 700 to 400)” (Giudice, 2012, p. 134). However, it is not possible to talk about a sectoral crisis, as the Belluno eyewear industry registered an upsurge of revenue, which reached €2.495 million in 2006, with an increase of 17,5% compared to 2005 (ANFAO, 2007). Consequently, it is more reasonable to speak about a profound transformation. Consequently, it is more reasonable to consider it a profound transformation in the productive organisation in spite of small firms, that had already started in the 2000s and which has been marked by two factors.

The first one is the competitive strength shown by the *Far East* in terms of production costs combined to the price variations due to Euro, which led leader firms to delocalise the production of some spectacles' components in Asia and Eastern Europe, activating a concrete process of internationalisation.

The second factor is related to the different entrepreneurial approach activated by many large firms related to the "verticalization of the production process" (Gamberotto & Solari, 2008, p. 8). This process, already started by many leading firms at the end of the 1990s, represented another relevant transformation inside the district which amplified its success: in fact, it allowed to directly control the firms' input and output and, hence, have better management of the supply chain. For these reasons, many of the small and medium-sized firms operating in the secondary industries (for example in the production of accessories, glasses' components and painting) disappeared because they were less competitive in terms of final price and found it difficult to sustain the production of large lots of spectacles' components according to the timing required by large firms. Furthermore, the introduction of commercial agreements between leader firms and the main international brands as well as the new international economic panorama have created strong entry barriers reducing or limiting the opportunities for new local firms to emerge due to the initial high entrepreneurial risks.

The process of delocalisation created an improvement in the revenue also in 2007 (€2.773 million), which increased by 10,9% compared to 2006 (ANFAO, 2008). However, the low quality of semi-finished products and other glasses' components made by *Far East* producers has brought many Italian leading firms to active a reshoring process

(Confindustria Belluno Dolomiti, 2010), bringing back the *Made in Italy* as a key competitive factor. In fact, in these years the *Made in Italy* concerning the eyewear sector was entering a “crisis” because it was “dried up” by the standardisation of the productive process delocalised in countries with low-cost labour.

The economic and financial crisis of 2008, which affected the United States, it also involved both Italy and the rest of Europe. For this reason, the eyewear district of Belluno was struck by a profound drop in exports and small and medium-sized firms (Graph 2) were heavily hit by the decrease in demand. Nevertheless, an explosive recovery in 2010 enabled to reinforce its dominance in the eyewear market, obtaining record results in terms of exports and revenues, thanks to both a rediscovery of three historical distinctive elements in the production process - innovation, tradition and style (ANFAO, 2010) - in order to properly satisfy new customers’ needs, as well the exploitation of the opportunities deriving from new emerging countries and their attitude to development and innovation. In fact, the following years have displayed a consolidation of the dominance in the global eyewear market of the Belluno industrial district. In this regard, the leader firms have been able to establish themselves in the global market through a different entrepreneurial approach, based on the equilibrium between the exploitation of the high level of know-how possessed by many small and medium-size firms inside the local system and the simultaneous exploration of new extra-district opportunities to innovate and reduce production costs.

In 2012, it began a fortification in the main emerging markets, mostly concerning some areas of Latin America, in particular Panama, Brazil and Venezuela, characterised by both a strategic position with the United States - one of the main markets in terms of exports - and mostly by a strong economic growth. Furthermore, in these years many Asian countries, such as China, South Korea and Japan, have acquired even more relevance in terms market performances and opportunities such as to lead the Belluno district to start a remarkable penetration process of these markets, obtaining, hence, a growing in revenue of €4.122 million, more than 9,4% compared to 2014 (ANFAO, 2016) and followed by an improvement of the employment (17.245 workers) and the number of firms (870) (Graph 2).

The continuous development which has marked the local productive system of Belluno has been affected by a slowdown in 2016 until the end of 2019. In particular, in these years the global panorama has exhibited a scenario of uncertainty, mostly characterised

by protectionist policies activated by the major markets of reference, the tensions among USA and China, the unknowns deriving from the Brexit and from the German market, the drop of petrol price and the upsurge of Fed's rates. In this situation of instability, the Eurozone, as well as the Chinese economy, have shown limited growth rates: direct effects of the economic and financial high risks which are connected to each other and linked by a circular relation of *cause-effect*. Nevertheless, the Belluno industrial district has been able to mitigate this negative situation, supported by the export performances and an enduring process of market adaptation, confirmed by the increase in both employment (18.082 workers) and firms (879) and the improvement of production output of €3.991 million (ANFAO, 2020).

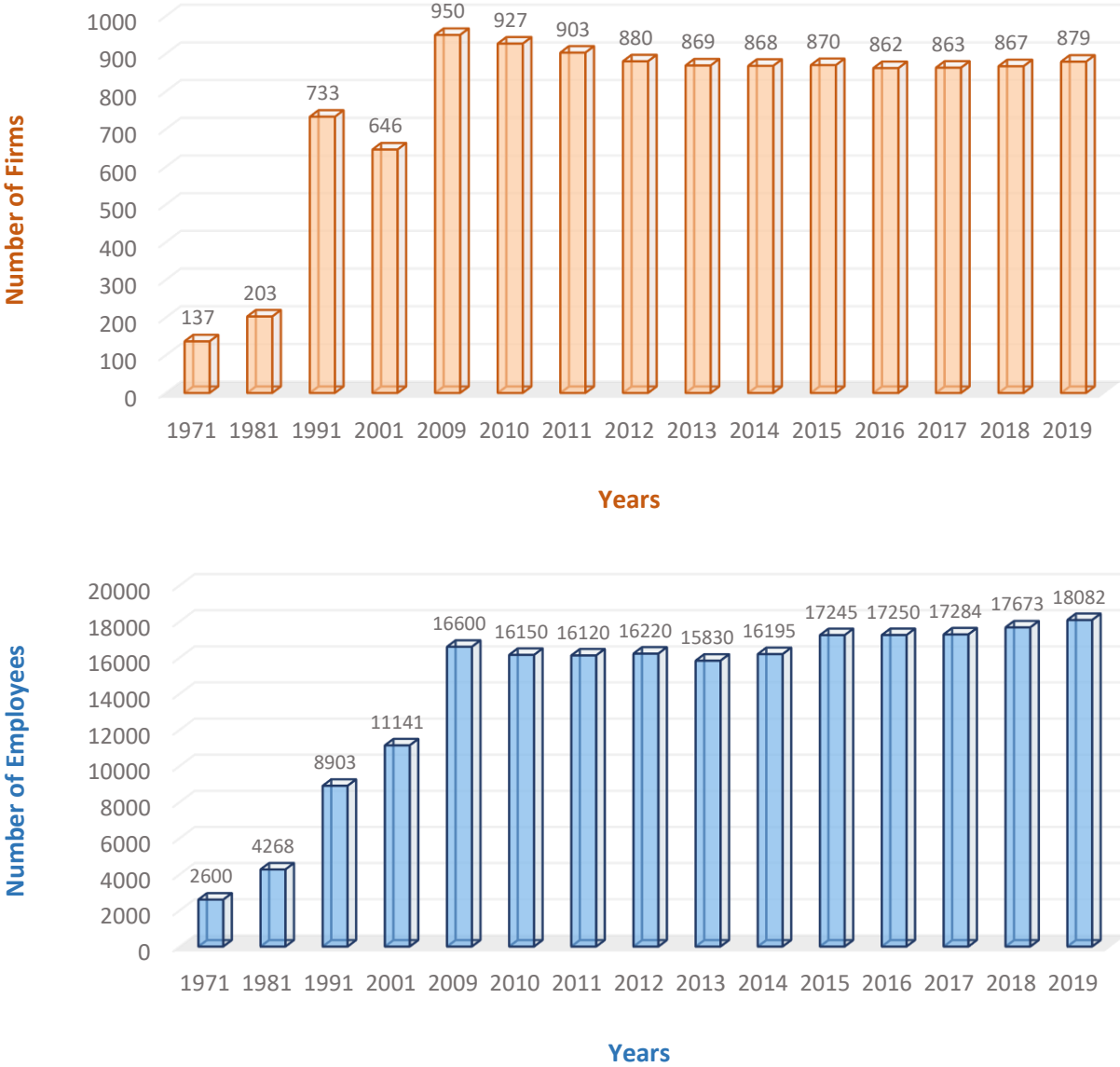
As underlined in this paragraph, over the course of time the Belluno eyewear district has considerably transformed.

The development of the district, which has taken a strong trajectory of growth in the last ten years, derives from the ability of the Italian leader firms to demonstrate an incomparable vocational and technical knowledge accumulated over time, such as to lead many international firms to create durable partnerships with them. In particular, the recent transformations occurred inside two of the most important Italian firms have given new opportunities of growth to the Belluno district.

The first one is related to Marcolin that, after the joint-venture with the LVMH Group at the end of 2018 which led to the foundation of the Thélios production site in Longarone for the production of sunglasses and eyeglasses frames, in 2019 has tightened its partnership with the LVMH Group, building a second glasses factory in the same area and reinforcing the relevance of the Italian eyewear sector on the international level, especially for the luxury eyewear segment.

The second and most significant fact concerns the already mentioned merging of two giants of the eyewear market, Luxottica and Essilor, which has guaranteed not only an improvement of employees and investments in the Belluno area but has also allowed the integration of different perspectives characterised by the same research of state-of-the-art products, innovation and specialisation. Consequently, when representing the evolution of the eyewear Belluno district, it is impossible not to discuss about the Luxottica's growth. This firm, which has profoundly influenced the relevance of this district, has been able to redefine its strategic behaviour during the years, efficiently adapting to changes of the market and developing unique levels of know-how.

Graph 2: Trend of the number of firms and employees in the Belluno eyewear district from 1971 to 2019



Source: ANFAO, 2020

2.3.1) Luxottica: the path of growth

The Luxottica case is emblematic because the reasons which have determined its global success lie in the Del Vecchio’s ability to realise its strategic vision focused on making Luxottica the driving force inside the worldwide eyewear industry creating, hence, positive spin-offs inside the Belluno local productive system. In fact, it is no coincidence that, in the company’s profile webpage, this firm is described as “a global leader in the

design, manufacture and distribution of luxury, fashion and sports eyewear with high technical and stylistic quality” (Luxottica, 2019).

Several important factors determine Luxottica's strategic approach and its international reputation. Firstly, the brands' vast portfolio grew in the course of time. In fact, the Italian firm was the first to collaborate with the world of fashion, carrying the Italian eyewear industry beyond its boundaries of action. Secondly, there is the notable global market coverage, which is the consequence of the firm's growth, mostly improved by the integrated vertical organisation.

The vertical integration of the productive process started at the end of the 1960s, in order to manage the overall manufacturing of eyeglasses frames under the Luxottica brand, since the production of single parts did not guarantee that qualitative leap to increase the production efficiency in terms of costs and time and acquire the efficacy control of the productive processes. In supporting this integration, as well as investments on technical and productive knowledge, the objective of Del Vecchio consisted in the creation of a forward vertical integration. For this reason, it was fundamental the acquisition of the eyewear dealership in Turin called Scarrone S.p.a., in 1974, aimed at directly controlling the distribution channels, in order to reduce the final product costs and eliminate intermediation margins. In the following years, as a consequence of the increasing demand, the production range was widened with a greater variety of frame models: in order to meet the growing demand, the district relations between Luxottica and many contractors, previously employees of the firm, were intensively utilised.

In 1981 Luxottica became a multinational company thanks to the setting up in Germany of its first international subsidiary. It was the first step in a rapid period of international expansion characterised by the entry in many other countries' markets, such as the United States, with the acquisition of an important subsidiary called Avant-Garde Optics Inc., and the building of wholesale nets in Spain, England, Japan, Holland and more other countries. After 20 years since its birth, Luxottica is directly responsible of the design, production and selling of the glasses' frames thanks to an ever stronger vertical integration and its dominance in the global market especially reinforced in 1988 with the fashion market's entry through numerous licence agreements with famous fashion brands, one of them being Giorgio Armani. In this regard, Del Vecchio understood that eyewear was not only meant to correct eye defects but can be considered a real fashion accessory. For this reason, Luxottica focused on the production of designer glasses: an entrepreneurial

strategy also supported by the acquisition of Vogue Eyewear in 1990 and numerous licensed brands. In the 1990s Luxottica consolidated its international leadership when it was listed on the New York Stock Exchange in 1990, a decision made to increase its dominance in one of the most strategic markets for its entrepreneurial approach, hence, opening to new growth opportunities. In these years, Luxottica accelerated its vertical integration process penetrating in the optical retail market through the acquisition of the United States Shoe Corporation in 1995, owner of one of the leading optical chains in North America: LensCrafters (Luxottica, 2019). In the same year, Luxottica enlarged its portfolio of proprietary brands with the acquisition of Persol, historical *Made in Italy* brand, characterised by style, uniqueness and excellence. In this regard, these two significant operations allowed to double up the 1995's revenue over the previous year. Nevertheless, the most iconic acquisition was made in 1999, thanks to the expansion of proprietary brands given by the American Ray-Ban brand.

Over the years the eyewear was gradually becoming a fashion accessory, for this reason, the acquisition of Ray-Ban represented the key to intensely concentrate on the sunglasses market segment, also supported by other previous significant acquisitions of brands like Vogue Eyewear (1990).

The entry of Ray-Ban in the house brands portfolio has not only strengthened the dominance inside an increasingly profitable market, but also has raised the revenue up to €2.416 million at the end of the 2000s (Sharadar, 2016).

The first ten years of the 2000s were characterised by an improvement of the revenue, which reached €5.798 million in 2009 thanks to the strategic approach focused on the acquisition of relevant brands inside the sunglasses market combined with the first steps in the e-commerce from 2008. In detail, a key factor was the acquisition of Sunglass Hut in 2001, one of the main chains specialised in selling sunglasses in North America, Australia and the United Kingdom and which, from 2005, started to develop in Europe, India, China and other emerging markets, becoming a point of reference for designer sunglass purchasing. In these years, the Luxottica's portfolio of licensed brands grew including numerous other brands like Prada and Versace (2003) and Tiffany (2006).

The portfolio of proprietary brands acquired more solidity as well, thanks to the acquisition of Californian Oakley Inc. in 2007, specialised in sports performance equipment including sunglasses, ski/snowboard goggles, sports visors and other accessories: in particular, it was enhanced the sport eyewear market segment through a

more significant market share in North America and all the stores previously owned by Oakley.

Innovation is a distinctive characteristic of Luxottica, which is mirrored in its customers' relations and firms' partnerships through the development of new instruments to improve stores' management and to discover new selling channels. In fact, in 2002 Luxottica presented the "STARS program" inside its wholesale division, that is a real service innovation to control Luxottica's knowledge of local markets and brands, to guarantee high-turnover, to offer new products to customers and preserve best inventory levels. Moreover, from 2008 Luxottica has laid its business roots on the e-commerce, as it will be explained in the last chapter, creating specific interactive platforms for Sunglass Hut, Oakley and Ray-Ban ("Ray-Ban Remix" platform to personalise Ray-Ban glasses' models). Additionally, the acquisition of the website Glasses.com in 2014, among the most advanced platforms of the digital optical sector, has led Luxottica to obtain a real laboratory for innovation while maintaining a strong relevance in the e-commerce environment. From this perspective of growth, the attention to research and development took a tangible turn due to the creation of smart glasses named "Google Glass" thanks to the partnership with Google established in 2014. In the same year, the research towards an ongoing innovation led Luxottica to create another agreement with Intel to produce the "Rader Pace"(Oakley smart eyewear) which offers the possibility to generate a personalised training program that can be activated with the voice. Although the introduction into the smart glasses market's segment has not given the desired result due to technical problems in the process of development with the virtual interaction, from 2019 Luxottica is collaborating with Mark Zuckerberg (Co-founder of Facebook) in creating augmented-reality Ray-Ban glasses, named Orion, and designed to substitute smartphones.

From the last part of 2014, the portfolio of licensed brands has continued to grow, covering many luxury brands such as Michael Kors and Valentino, respectively in 2015 and 2016, proving how Luxottica has acquired and consolidated a leadership position in the high-end eyewear market, consolidated by important results in terms of revenue (€9.085 million in 2016).

From 2016 to 2019, the penetration in the Italian economic panorama has been particularly boosted by the acquisition of Salmoiraghi & Viganò at the beginning of 2017, one of the main Italian optical retail brands with 376 corporate owned stores (Luxottica,

2019), that allowed Luxottica to rely on Salmoiraghi & Viganò's entrepreneurial spirit based on high-quality service, customer experience, quality products and innovation. Successively, Luxottica completed the acquisition of Barberini S.p.A., the most important worldwide optical glass sun lens manufacturer, that enabled Luxottica to fortify the *Made in Italy* production and know-how in prescription lenses and glass sun.

The growth of the Italian firms reached an important accomplishment thanks to the previously mentioned merging between Luxottica and Essilor. This, in fact, generated an international echo because it permitted not only to enlarge the Italian firm's range of action, allowing it to produce and distribute prescription frames, ophthalmic lenses and sunglasses as a global leader, but also consolidated the excellence of *Made in Italy* worldwide.

From the financial perspective, this vertically integrated multinational corporation totalled €17.380 million in 2019 (Graph 1).

It is clear how, over the course of years, Luxottica has exploited numerous opportunities of growth, becoming a "global district firm" (Camuffo & Grandinetti, 2011, p. 53) and favouring the evolution of the Belluno district along a knowledge trajectory mainly thanks to relationships based on productive mutual advantages and the sharing of know-how with its referring local firms. However, because of Luxottica's processes of internationalisation and vertical integration, which have taken an important turning point from the 1980s and 1990s, those interactions have contracted to few local firms. This effect was particularly evident both because of the acquisitions of Ray-Ban and successively Oakley, which led Luxottica to delocalise part of the production from Italy to China and America, and mainly due to the partnership with Essilor, rather than create business relations with the firms within the Belluno eyewear district. Undoubtedly, this diminishing of relations among Luxottica and the Belluno local system has been a direct consequence of the strategic approaches activated by the Italian firm to reach the global market's opportunities over the course of the years.

Nevertheless, the role of the Belluno productive system for Luxottica is still significant. In fact, the *heredity skills*, such as the know-how and the research of excellence, deriving from the linkage between Luxottica and its "place of birth" (Belussi & Caldari, 2009) continue to represent for the Italian firm the competitive resources at the basis of its entrepreneurial spirit.

2.4) Variation in the combination among cooperation and competition

At the basis of the Belluno industrial district's expansion, especially from the 1970s, there have been some fundamental and unique factors peculiar to the industrial district system, that have been the generators of the firms' competitive strength in the global panorama. In particular, it was essential the generation of a *common entrepreneurial culture* or, using a Marshallian concept, the creation of a specific industrial atmosphere focused on know-how, social capability and firms' interconnections. This industrial atmosphere has brought the firms' development through imitative behaviours rather than through a "gemination process", in which the technical and business knowledge spread allowing the combination of traditional competencies with the capacity to innovate. Consequently, the direct availability of the pool of competencies and technical knowledge connected to the eyewear environment have created many spin-off effects, favouring the creation of external economies inside the industrial district. Within the Belluno local system, the industrial atmosphere has spread generating an interdependence among firms characterised by a combination of cooperation - source of a common socio-cultural context, profitable relationships in terms of transaction and production costs, dynamic workforce mobility and economies of knowledge - and competition - engine of innovation and mutual improvement. In this regard, every firm operating inside the local system is "both autonomous and part of a productive mechanism" (Bagella & Becchetti, 2000, p. 49) able to generate competitive advantage.

Until the internationalisation process of large firms, the Belluno eyewear district has been characterised by a population of firms in which both large and small and medium sized-firms have interacted within the same economic and socio-cultural context. In particular, the development of this local system was strictly connected to the numerous subcontracting relationships which amplified the specialisation of each firm in a specific step of the production process, generating a proliferation of manufacturing firms and small specialised laboratories thanks to the enormous availability of skilled workforce. However, even though these circumstances have been at the basis of its origin, the Belluno eyewear district is an interesting case of study because the global market challenges generated a qualitative change of its structure.

The process of development, characterised by important international expansions and structural slowdowns until 2010, has underlined the significance of market strategies and

their impact on the Belluno district structure, increasingly characterised by a gap between leader firms able to grow and innovate and small and medium-sized firms unable to compete against their market power. Large firms increased their management of the production process vertically integrating and, in some situations, delocalising outside the district some production steps that previously were entrusted to local contractors: an example would be Luxottica's vertical integration process combined with significant market acquisitions and joint-ventures in Germany, United States and Japan from the 1980s, which caused the drop of the local suppliers especially during the 1990s. Furthermore, the continuous investments on research and development, the entry in the fashion industry and the capability to compete in the global panorama have consolidated the supremacy of leader firms inside the Belluno industrial system, fading and changing the *typical district relationships* between firms at the basis of Becattini's studies. Over the years, the tendency to internalise the productive processes has transformed the overall structure of the district, thereby modifying the combination of cooperation and competition, that at the beginning of the district was a key factor for its expansion. In this specific industrial district case, there has been an inclination to shift from cooperation to hierarchy, while the competition especially has involved small firms that have been forced to resize or depreciate their manufacturing capability in order to maintain business relationships with large firms. From this perspective of analysis, it becomes essential to understand the concept of "hierarchy" (Carminucci & Casucci, 1997), which underlines, as in the case of the Belluno district, a transition from a system based on resources and competencies equally distributed among interdependent firms (the district itself) where cooperation and mutual trust prevail, to a system in which specific resources are concentrated in the hands of few independent economic actors (leader firms). Therefore, it is a model which is mainly evolutive for large firms. The main effect of this context, especially during the crisis in the last part of the 1990s, was the disappearance of many contractors and small firms. The shrinkage of demand and the relationships' conditions imposed by large firms caused the elimination of the *weak links* within the production chain and the *productive reorganisation*, which reduced the firms' relations within the district system (Calcagno, Faccipieri, & Rullani, 2000). The gap between leader firms and those small and medium-sized widened, converting the local system of relations into a system of dependence and accentuating the autonomy of leading firms from the territory. Only a portion of small firms was able to adapt through a specialisation oriented to a niche

market or by adopting specific business strategies with large firms, developing specific synergies based on the exchange of information. Although the notion of industrial district analysed in the First Chapter has allowed us to underline that at the basis of an industrial district development there are factors such as the equilibrium between cooperation and competition, mutual trust based on social cohesion and a common socio-cultural environment, when we take into consideration the evolution of the Belluno industrial district it is possible to notice a relevant condition. In fact, the above-mentioned factors have been central elements in the first phases of its consolidation but, over the course of time, it is clear how the Belluno eyewear district has progressively moved away from the typical industrial district model towards a hierarchical local system, in which only some firms determine its structural evolution as well as the eyewear market dynamics.

The development of the district has created the condition in which, on one hand, competition is played around the capacity of large firms to operate inside the global market and the ability of small and medium firms to represent an added value for their growth, on the other hand, the cooperation has given way to a different industrial district system based on a hierarchisation of firms and their influence both internal and external the district's boundaries. Hence, from the strategic perspective, the internationalisation path has implied a reorganisation both of the value chain and the territory, since it has been necessary to identify the specific district competencies which have to be improved on the local level and the skills and abilities that, instead, have to be externally valorised. In this regard, it becomes clear the choice of leader firms to create agreements or joint-ventures with actors of international dimension to amplify their opportunities to innovate and increase their pool of knowledge. Consequently, in relation to the Belluno industrial district case, the concentration of production both in the vertical and horizontal form or the delocalisation process put in place by leader firms, have to be intended not only as a change of strategy in line with the new market trends, but also as the variation of relations between firms inside and outside the eyewear district. These relations are now dictated by a different strategic approach based on the necessity to succeed in the international market. Thus, they require the creation of relationships between firms able to guarantee a constant improvement of performances in terms of innovation, augmentation of investments on research and development, adaptation to a more sophisticated demand and the acquisition of new technical and productive competencies: conditions that most of the small local firms are currently unable to satisfy.

2.5) Deterioration of the socio-cultural context

In the previous paragraphs we saw how, due to the growth of Belluno eyewear district on the international panorama, the relation between the socio-cultural context, considered by Marshall and successively by many other scholars as one of the peculiarities of this local productive system, and the economic development of the district has gradually gained a different importance for the main economic actors inside it. In fact, the success of leading firms, thanks to their penetration in the main industrial global markets and their ability to directly manage worldwide supply chains, weakened the background of cooperation between the economic actors inside the Belluno district which was at the basis of its growth.

At the beginning of the district evolution, the leader firms had the role of institutional drivers, especially in relation to the creation of a common entrepreneurial spirit and the sharing of information and innovation within the district. However, the strong economic asymmetry between these firms and those of small and medium-size has gradually led leading firms to lose interest in investing resources to support the mechanisms for the development of external economies. In particular, both the productive delocalisation as well as the vertical integration, of which Luxottica is a clear successful example, have increased the distance with the industrial district local environment, transforming it in a mere productive system built on institutional cohesion no longer useful in terms of strategic development. From a general point of view, it is possible to emphasise how the capitalistic development of large firms “tends to deteriorate the socio-cultural background of local systems” (Cangiani, 2001, p. 129), disregarding the system of values, cooperation, relationships with the territory at the basis of every industrial system's path of growth. In other words, the relation between the social and economic system has a tendency to miss its integrity. In fact, the socio-cultural aspects represent fundamental elements at the beginning of the local industrial system until its modernisation and consolidation in the global panorama that change the priority of leading firms towards a progressive adaptation to the new market logics. In their turn, these logics acquire the condition of new contexts with which the district's development has to be systematised. In the Belluno case, this condition is confirmed by the tricky approach of the main local institutions as Certottica, Reviviscar and ANFAO in rebuilding in a modern way the socio-cultural dimension and trying to create a connection between this dimension with the

new economic context of leading firms, which have demonstrated a deficiency to revive the socio-cultural context in the light of the changes inside the district. Only in these last years specific behaviours have emerged in the valorisation of the socio-cultural dimension inside the district context that gradually demonstrates the inclination to create *anchor points* with the territory and its manufacturing tradition (L'Amico del Popolo, 2019), especially kept alive by small firms and specialised laboratories. In this regard, it is relevant the role played by SIPAO (acronym of Selezione Italiana Produzione Articoli Ottici) in involving small and medium-sized firms under the same “Eyewear District Belluno” brand at the international exhibit called SILMO in Paris⁴, with the purpose to re-create that sense of belonging that characterised the origin of the industrial district. The willingness to restore the socio-cultural context has also arose thanks to the recent establishment of the *Politecnico Internazionale dell'Occhiale* in Longarone, inaugurated on 11th September 2019, which has to be considered a detached branch of Certottica, that remains the main training structure recognised by the Veneto region.

The project was born thanks to a memorandum of understanding between ANFAO and the Veneto region to regenerate the historical know-how, relaunch craftsmanship, manual skills, creativity, values of cooperation and interrelation between firms in a perspective in line with the internationalisation of the Belluno industrial district (Vietina, 2019). In other words, it represents a kind of incubator able to continuously enrich, through specific services of training managed by Certottica, aiming at the recovery of firms' cooperation, traditions and competencies. It is clear how the *Politecnico Internazionale dell'Occhiale* represents the concretisation of the *Cittadella dell'Occhiale*, a project that have been based on formalising the informal interrelations among the actors of the district, as well as the diffusion of technical and economic information, the promotion of cultural events and workforce training in order to create a dynamic and cooperative system. From this perspective of examination, it seems clear the attempt to modernise the socio-cultural context. However, there must be a coordinated management between the economic development of the district and its social and cultural background. In other words, there must not be a devaluation of the historical background of the district inside the future objectives and projects of firms; otherwise, its unique identity could disappear.

⁴ The international exhibit called SILMO is one of the most important exhibitions of optometry and optics like MIDO and OPTIFEAR.

2.6) Human capital as driver of the industrial district's growth

In a global economic panorama increasingly based on knowledge, in which new ideas, skills and vocational capabilities represent the elements for innovation and economic and social development, human capital can be viewed as a key factor in the growth of a local productive system. The concept of human capital denotes the capabilities and information of those individuals working in the firm, from the owner to the workers. In other words, human capital is an intangible asset which is classified as the economic value of a worker's experience and skills and which strongly influences the path of growth of local industrial systems (Kenton, 2019).

Until now, the industrial districts have proved to be favourable environments for the accumulation of knowledge, mostly generated through interconnections between individuals and experiences. In particular, the experiences become the drivers to acquire new knowledge since they give the foundations to create new cognitive processes (Sloman & Fernbach, 2018).

These forms of social interactions are able to generate the local knowledge which is incorporated in individual's capabilities, creativity and intellect, and grows with the spreading of tacit knowledge inside the same local system. Consequently, as underlined above, industrial districts are fertile backgrounds for the creation of local knowledge. However, in competitive contexts increasingly driven by global dynamics of growth, affected by deep economic, financial and social changes as in the case of the Belluno industrial district, tacit knowledge is not sufficient to feed the innovation processes and guarantee the competitive approach of the district firms. In fact, tacit knowledge constitutes only one form of knowledge, which has to be combined with codified knowledge, transferable through a formalised language and boosted by learning activities. A firm's economic growth is strictly correlated to the quantitative and qualitative conditions concerning the learning processes, the possibility of taking advantage from the codified knowledge flows inside specific networks and the ability to draw value from the owned tacit knowledge (Rullani, 2004). In other words, the success of the local productive systems strictly depends on the ability to combine these two typologies of knowledge. Since inside the local productive system the human capital constitutes a key factor in its innovative potential, this intangible asset constitutes the core element to generate and manage the innovation inside a firm, allowing it to be competitive inside the current

globalised economy based on the improvement of tacit and codified knowledge. In its turn, innovation contributes in determining the intellectual capital growth, becoming the element to regenerate the firm's competitive assets.

From a macroeconomic perspective, in the *Theory of Growth*, intellectual capital constitutes "a central role in the advancement of firms, together with the development of technical and scientific knowledge" (D'Amore, Iorio, & Lubrano Lavadera, 2014, p. 269), since the investments on human capital create a continuous growth in the course of time, particularly based on factors strictly related to the functioning of economic system: in fact, this growing process can be defined as endogenous.

According to Lucas (1988), human capital, generating positive externalities, is able to improve the productivity of individuals: in this regard, the higher the number of specialised workers and people focused on the research and development, the greater is the generation of new knowledge, so it becomes fundamental to acquire knowledge through the learning processes. Therefore, it is clear how the input to create human capital is the human capital itself in which an improvement of investments in its acquisition of competencies becomes the driver of a stable endogenous economic growth directed by the economic agents inside the firm and opportunely combined with the development of specific technical and scientific knowledge.

To confirm the relation between human capital and firm's growth Arrighetti, Landini and Lasagni (2014) in the study about the Italian manufacturing firms according to the *Capability-based Theory* of the firm, highlight how the propensity to invest on intangible assets, which directly impact on innovation and firm's performance, is principally related to the human capital's competency level inside the firm. Consequently, the improvement of human capital becomes the precondition to create innovation inside the firm.

In relation to the Belluno eyewear district, human capital has represented a key factor in its economic development. In fact, it is acknowledged that the Belluno local productive system has built part of its international success thanks to the employees' competencies in the production of a unique "accessory", which combines traditional manufacturing skills with new technologies, technical with artistic abilities, tradition with innovation. These peculiarities derive from the know-how that is continuously fed through learning processes, research and innovation activities and the transfer of tacit knowledge between individuals focused on creating an added value within the firm's productive system.

As mentioned in the previous paragraph, in the regulation of the mechanisms of acquisition and development of knowledge a key role is played by Certottica that is composed by four main areas of intervention rooted around the concepts this Institute has for safety and quality of the product, guaranteeing an all-round service in terms of technical and scientific preparation. In detail, the *Certification Area* is involved in certifying the conformity of products, by offering companies the licence to introduce goods into the market on the basis of specific requirements.

The second area is the *Education Area*, which offers an adequate technical-scientific training in line with global business needs, allowing firms to succeed on the market.

Another area is called *Standardisation Area*, which is built around the standardisation activity through which national and international standards are established in order to monitor market's changes and protect products' quality.

The last one is the *Research and Innovation Area*, focused on approaching the problems of entrepreneurship to discover modern and innovative solutions.

Concerning the topic of this thesis, in the next paragraph we will analyse in more detail the learning mechanisms managed by Certottica both through a direct support to district firms, as well as through the creation of specific training courses with regional education Institutions.

2.7) The role played by Certottica in the development of knowledge

The growth of competencies inside the eyewear industry, increasingly influenced by the dynamicity of markets' changes and the continuous necessity to innovate, become a necessary condition to guarantee firms' competitive advantage. In this regard, the development of knowledge allows to create, maintain and change the competencies and vocational skills over the course of time in order to be in line with the qualitative requirements imposed by the market's conditions as globalisation, competitiveness and technological evolution. For these reasons, Certottica through its education area provides adequate technical and specific training courses for the Italian eyewear sector, in order to improve the knowledge of each person and create favourable conditions to transform this knowledge into new knowledge. It is relevant to underline the accumulation of knowledge is a difficult procedure since the process of learning is both experiential and social.

However, it is easier to learn from other people who have experience on the task that a specific individual wants to acquire (Hidalgo, 2015). In this regard, the Belluno eyewear district has proved to be a perfect example of source of knowledge which guarantees a deep interrelation among individuals and their experiences, so that to help the ongoing process of district's innovation and the improvement of know-how.

Certottica constantly monitors the district dynamics taking as reference the firms' necessities and tendencies in order to program and project specific and adequate training proposals directly required by firms. In particular, through the learning activities and vocational experiences planned by Certottica, the Belluno human capital is supported in the development of ideas and experiences and in the acquisition, renovation and improvement of skills as well as technical and organisational competencies.

The training paths are organised through a strong synergy between Certottica, district firms and local institutions that are operative in the territory and have care of its socio-economic development. Furthermore, all the other three areas of which Certottica is composed constantly co-operate with the education area to offer an appropriate and up-to-date service.

Inside the mechanisms which regulate the Belluno industrial district, the role played by Certottica related to the training offer has always been relevant since it has guaranteed a continuous maintenance and improvement of specific capabilities within the district. However, from July 2019, Certottica has taken on a leading role in the management and development of knowledge flows thanks to the financing of €1.5 million by the European Social Fund (ESF) of all its eight training projects, which have been proposed in the three-year protocol between Veneto region and ANFAO. This protocol, focused on the renovation of human capital following the increasing technological innovations and market's changes inside the eyewear sector, has many meanings. In fact, not only it puts in place an efficient and direct collaboration between public and private subjects but it has also given relevance to the Italian eyewear sector allowing district firms to have the opportunity of investing on human resources' competencies in order to amplify the pool of professional skills and technical profiles to rely on, simultaneously enhancing the competitiveness of the industrial district through a focalised education (De Col, 2019).

From a macro-perspective, these eight training paths managed by Certottica and supported by the collaboration with Reviviscar, are divided into two key training branches: the first subdivision, called "POW-ER. People on Work Eyewear", concerns the

Higher Vocational Training for unemployed and graduates and it is composed by four different training courses which also include the development of soft skills. Through this typology of training activities, Certottica aims to reduce the gap among school education and vocational environment, promoting the business culture and entrepreneurial spirit as main elements to renew the local socio-cultural context inside the Belluno district. In detail, Certottica organises both training courses as well as traineeships (free for the firm) for young unemployed and people who have to join the labour market, creating the opportunities for the trainee to acquire definite competencies inside the firm in which is required to host the traineeships, and for the firm to eventually hire them. In this regard, on the basis of a definite training course, Certottica manages these traineeships trying to guarantee an efficient result for participants, that can be obtained only within a working environment.

The second training offer regards the *Vocational Training* focused on the improvement of employee's competencies through four specific paths under the name of "T4.O-Training for Organisations" that Certottica organises on the basis of specific firms' requirements. In particular, these training activities comprise numerous proposals on all the firms' issues of interest: from production, strategies of marketing, processes of internationalisation to logistic, firm's management, industry 4.0, systems of data security and project management.

The peculiarities of the services of training, which are exploited by about 90% of the Belluno eyewear district firms such as De Rigo, Safilo and Marcolin, concern both the continuous updating of all individuals' competencies inside the district firms, from the business owner to employees, and also their flexibility in terms of firms' necessities, since they are completely *modulable* (Savi, 2020).

The training activity is organised and managed through determinant circumstances that, on one hand guarantee the most suitable conditions in terms of availability of specific training profiles and, on the other hand, enable an effective improvement in terms of technical and professional competencies. In this regard, Certottica cooperates daily with the firms which benefit from its services. It is relevant to underline that Luxottica does not exploit the training activities provided by Certottica since, as it will be explained in Chapter 4, the firm directly organises training courses within its Luxottica University, an incubator of competencies which provides training programs both on-line, as well as in-store and in classroom settings.

As we said before, in relation to the enormous necessities of vocational skills and technical competencies required by firms, the training courses offered to Belluno firms have a wide range of actions, which are mainly involved in guaranteeing an adequate generational change to the manufacturing pioneers and regenerate their know-how, considered by Belluno firms as “an essential condition to allow the rebirth of the craftsmanship and creativity values” (Boito, 2020). For this reason, on 17th January 2020 has been activated a project to build a prototyping laboratory in which it is possible to train a specific professional profile called “protitipista da banco”. This laboratory, financially supported by many leading firms as Luxottica, Safilo, Marcolin, by important Institutions as ANFAO, Reviviscar and Confartigianato Belluno and by the Treviso-Belluno Chamber of Commerce for a total investment of 250 thousand Euro, it has the aim to preserve and share knowledge and technical skills of local eyewear forerunners, like Fabio Stramare, to the new generation of “artisans”, through an efficient combination of theoretical and practical training (L'Amico del Popolo, 2020). The focal point of this typology of training paths will be related to the direct support of the main actors in the field of eyewear's craftsmanship who through their experiences and know-how will be able to rediscover the *Made in Italy* of the product (Da Rolt, 2020). The growth of competencies inside the Belluno industrial district is as well supported by Certottica's management of the *On-Demand Training* based on the individual and specific firms' requirements financed by Fondimpresa, one of the most important Interprofessional Funds for the Vocational Training: each member of this Found has its own “Training Account” which it can directly use to update and retrain its employees in the most appropriate way.

In the development of training paths inside the Belluno eyewear district a relevant role is played by the Higher education Technical Institutes (HTS), top-class education centres set up by the Prime Minister's Decree of 25th January 2008 as alternatives to Italian Universities, whose aim concerns the training of high-skilled technicians in strategic areas for Italian's competitiveness and economic development. They are set at Level 5 of the European Qualifications Framework (EQF) and, subsequently to a course lasting four semesters, they release a technical level qualification. In this regard, from 2014 Certottica cooperates with HTS Cosmo Foundation-New Technologies for *Made in Italy* in the organisation and management of the two-year specialisation course, unique in the world, to train high-skilled eyewear Product Managers (ITSCosmo, 2020).

The course, called "ITS Academy in Design e Tecnica dell'Occhiale", is composed by both 1200 hours of training and laboratory activities as well as 800 hours of firm's traineeship, in order to give students a broad and detailed knowledge of the eyewear, from the instruments to comprehend market's tendencies and the creative process at the basis of the product's creation, passing through its computer model, to its prototyping and industrialisation, in addition to the possibility of being assisted by company profiles involved in the eyewear's productive development. The importance of this typology of education course is not only determined by the increasing number of the Belluno district firms which support it (currently 50 firms among which De Rigo, Marchon Eyewear, Marcolin, Luxol, Faoflex), but also because it allows an enlargement of the pool of high-skilled profiles in this sector allowing an endless regeneration of knowledge and improvement of innovation processes inside firms, simultaneously favouring the generational turnover (Da Rolt, 2020). The training process managed by Certottica not only concerns the relationships with COSMO Foundation and local firms, but also gives relevance to the strong collaboration with Italian universities and schools in the province of Treviso and Belluno. In particular, at the beginning of 2020, the education area of Certottica organised two important orientation activities, respectively with the "Segato-Brustolon" Higher Education Institute of Belluno and with the "Enrico Fermi" Higher Education Institute of Pieve di Cadore, in which the employment opportunities inside the Belluno eyewear district were shown to young students who also had the opportunity to carry out work activities related to the eyewear's production under the supervision of Fabio Stramare and Andrea Finotti, two of the most important designers within the Italian eyewear industry.

The commitment of Certottica in the intensification of relations with training institutes involves many Italian universities in order to favour the district's growth in terms of product and process's competencies. In particular, with the University of Padua from March 2020 will start a master's degree followed by an internship wholly dedicated to the eyewear and sports industry, in which it will be possible to give depth to the eyewear product within the university environment (Da Rolt, 2020). Furthermore, it is relevant to underline that, from 2006 Certottica is collaborating with Ca' Foscari University, and in particular, with the "Department of Environmental Sciences, Informatics and Statistics", with numerous projects concerning *environmental protection* focusing on the analysis and development of production materials more environmentally friendly and recyclable.

In conclusion, the development of the Belluno industrial district and its mechanisms to favour the process of training are constantly attracting many economic actors, both national and international: for examples, the LVMH Group has decided to create two industrial poles through two joint-ventures with Marcolin, in order to exploit the capabilities of one of leading firms inside district, with the purpose of creating a product strongly competitive in the global market and in line with customers' needs. The result is the creation of a solid net of relations between this local productive system and firms which is based on an inimitable flow of competencies and know-how focused on the creation of a product that nowadays has become the symbol of quality and design over the world. In this regard, Certottica is playing a determinant role as driver to guarantee a continuous improvement of knowledge and its sharing among the economic actors, which decide to interrelate with the Belluno eyewear district through many initiatives and projects. These, on one hand, permit the creation of new knowledge through its dissemination and absorption, on the other hand, allow the Belluno local productive system to constantly innovate, becoming a worldwide referring point within the global eyewear industry.

Figure 1: Certottica, Italian Institute of certification of optical products



Source: Spex Magazine, 2017

CHAPTER 3

INDUSTRIAL DISTRICT AS A SOURCE OF KNOWLEDGE CREATION AND REGENERATION

3.1) Introduction to the chapter

The objective of this Third Chapter is to underline the role of intra-district flows of knowledge, which allow firms to improve the process of innovation and obtain competitive advantages. The analysis of these aims represents the basis for a deeper understanding of the idea of the industrial district as a cognitive system and how processes of knowledge formation and dissemination take place, allowing this local system to become a system for the local innovation.

Many industrial districts, including the Belluno local system, are often originated from the improvement of production capabilities essentially based on the craftsmanship diffused in the local area of origin. Thus, a set of specific manufacturing knowledge is often the factor at the basis of the initial economic development of the industrial districts. Then, the industrialisation and specialisation of local firms generate the intensification of learning processes based on knowledge transfer and regeneration, allowing to generate “an added value to their products” (Albino, Garavelli, & Schiuma, 1998, p. 2).

For this reason, the processes of acquisition, transfer and creation of knowledge acquire a key role in the development of new competitive strategies. In fact, the enhancement of this *intangible source*, that differs depending on the firm’s operation field, has been classified as the main success factor for the growth of district firms and the beginning of their international expansion (Becattini & Rullani, 1993).

Although the aspects which have contributed to the rise of local productive systems are numerous, such as the emergence of specific socio-cultural contexts, the development of flexible specialisation reinforced by networks of communication between firms and a widespread innovative capacity; the driver at the basis of these elements is the exploitation and valorisation of specific competencies and abilities concerning the industrial sector of reference. In this perspective of analysis, industrial districts can continue to operate as local innovation systems and increase their competitive advantage,

only if they are able to efficiently manage the flows of knowledge inside the socio-economic environments in which they emerge and evolve, thus improving their competitiveness inside the global value chains (GVCs). In this regard, the last paragraph concerns the interpretation of the effects caused by Coronavirus in the reconfiguration of the global value chains. The pandemic caused by the virus since the first part of 2020 has negatively affected all industrial sectors, from tourism and transportation to non-food and manufacturing, forcing all Countries to reformulate their development models to challenge the economic consequences of the pandemic.

3.2) Interpretation of knowledge

The process of globalisation has opened new horizons in terms of technological progress, developments focused on enlarging the interconnections between firms and challenges in satisfying customers' needs.

Following the viewpoint adopted by one of the most important pioneers in this field of economic science, Michael Polanyi (1966) underlines how knowledge can be targeted as “an abstract concept, which is built by individuals, group of people or organisations, both consciously or unconsciously, through the interpretation of a set of information that they acquire by means of experiences, and that is able to give them a physical or/and mental ability in an *art*” (Albino, Garavelli, & Schiuma, 1998, p. 54). Based on this definition, knowledge, according to Albino, Garavelli and Schiuma (1998), has three main characteristics (*structural, processual, functional*) that are strongly interconnected.

In short, the set of information which composes knowledge represents its structural form. Nevertheless, it is important to underline that it is inaccurate to define knowledge as a mere aggregate of information. In fact, while the owner does not influence the information since it is an objective data, knowledge is a collection of information which depends on the interpretation process performed by the owner of that set of information and comprises different degrees of *complexity, specificity, transferability* and *appropriability* (Huber, 1991). Consequently, to correctly interpret the concept of knowledge it is essential to distinguish simple information from information related to a specific meaning, that is knowledge itself. Once this information is codified, the knowledge deriving from the interpretation process determines the skills and core competencies of

individuals and/or organisations allowing them to achieve definite tasks. Each skill is always related to a *specific task*, which is interpreted as a purpose that can be reached in given conditions (Leplat, 2008).

From the industrial district perspective, it is not the level of knowledge within it what is essential, but rather its dissemination and regeneration among the economic actors. However, not all forms of knowledge can be easily propagated. In fact, there is a different level of knowledge's accessibility, which alters its capacity to be transferred.

Polanyi distinguishes between two typologies of knowledge: the first one is *explicit knowledge*, which can be readily codified, stored, articulated and accessed (Hélie & Sun, 2010), and it can be easily shared to other people since it is expressed through systematic and formal languages, diagrams and tables (Nonaka, 2007); an example is given by the scientific data of an experiment, which is a group of objective facts, information, and scientific knowledge expressed through formulas, tables, and texts. This knowledge is the opposite of *tacit knowledge*, a term utilised by Michael Polanyi in his work *Personal Knowledge: Towards a Post-critical Philosophy* (1998), which indicates the knowledge that is difficult to formalise and is hard to communicate to other people. In other words, "we know more than we can tell" (p. 4). Tacit knowledge is, therefore, the personal knowledge which is generally within people's minds, perceptions and behaviours but cannot be readily expressed, since it comprises personal capabilities, skills, know-how, intuitions and insights, and for these reasons it can be directly *uncapped* (Casonato & Harris, 1999). It is commonly shared through analogies, interactions, discussions and experiences between people that modify the way in which it is interpreted. In other words, concerning the eyewear industrial district case, it is possible to consider tacit knowledge as the know-how possessed by the eyewear craftsman, whose product is the result of his working capabilities, creativity, ideas and experiences.

It is relevant to highlight that through the codified knowledge we are able to comprehend and acquire a portion of tacit knowledge: only by exploiting the latter, it is possible to utilise codified knowledge. Consequently, tacit knowledge represents the filter to interpret codified knowledge and recode its content, favouring the process of creation of new knowledge.

To complete the background which identifies the forms of knowledge analysed by Polanyi, it is appropriate to underline that these can be acquired collectively or individually. For these reasons, it is possible to classify knowledge in four different groups. The first one

comprises the *explicit* and *individual* knowledge and it regards the technical capabilities; the second group comprises the *explicit* and *collective* knowledge and it represents laws, regulations and rules; the third one includes the *tacit* and *individual* knowledge and it indicates the intuitiveness, while the *tacit* and *collective* knowledge are grouped in the fourth group which represents the *wisdom of social practice* (Baumard, 1999).

A further consideration related to the classification of knowledge is given by Corno, Reinmoelle and Nonaka (1999) who categorise it into *technological* and *scientific knowledge*. In particular, the first form of knowledge includes the capabilities and experiences owned by an individual; thus, it is characterised by a high level of “tacitness”, and it is difficult to be shared and communicated. The second kind of knowledge is codified and easily shared since it is based on data of public nature.

Dasgupta and David in *Arrow and The Ascent of Modern Economic Theory* (1987) highlight how the two kinds of knowledge are differentiated according to the objectives that communities of technologists and scientists have set for themselves. On one hand, the scientific community seems concerned with the firm’s *stock of knowledge* and it is dedicated to favour its growth; on the other hand, the community of technologists is interested in the private economic rents which can be gained from that stock. In other words, considering the social role of scientists, the knowledge’s stock is perceived as a “public consumption good”, whereas on the basis of the role of the community of technologists, knowledge is considered as a “private capital good” (Dasgupta & Paul, 1987, p. 522). In detail, the pool of information of this second type of knowledge is a direct consequence of both the firm’s stock of knowledge as well as the individual cognitive resources devoted to its development.

To complete our examination in interpreting knowledge, it is appropriate to underline the main characteristics that target it as an *economic asset*. As explained above, the peculiarities of knowledge not only complicate its measurement and observation, but also the processes of its creation and dissemination. In this regard, the main challenge of the *Knowledge Economy* is to ensure an efficient usage of knowledge providing incentives to the single user in order to create it in a socially useful way.

The first characteristic which identifies knowledge as an economic asset is its *non-excludability*, since making it exclusive and controlling it privately can be problematic and expensive. In fact, it is often impossible to prevent other firms from taking advantage of knowledge’s externalities. For example, the introduction of a new product into the market

allows other rival firms to capture some key elements in the production process of that product and, thus, to turn them into competitive advantages.

Furthermore, knowledge, being an *inexhaustible resource*, does not make economic agents rivals for its usage and thus, can be exploited by an unlimited number of people at the same time, without losing its value. This characteristic is defined as “infinite expandability of knowledge” (Cowan, David, & Foray, 2000, p. 222) since the users of knowledge are more numerous than its creators and can grow without limits in both geographical and historical terms.

In addition to the infinite expandability of knowledge, this resource is also *cumulative*: it does not only represent the output of a cognitive process, but mostly it is considered as an input to generate new knowledge and ideas. Therefore, the production of knowledge has the potential to generate a “combinatorial explosion” (Foray, 2004, p. 96). In fact, even if this resource is hard to manage, it can be used an infinite number of times to create new knowledge, which in turn is non-rival, cumulative and non-excludable, and it increases the stock of knowledge already owned.

As will be explained in the next paragraphs, from the industrial district perspective, knowledge can be seen as the engine which enables the correct working of the cognitive system represented by the district itself and, thus, the *vital source* that allows each firm within the industrial district to develop and improve its value chain. Consequently, the continuous creation of knowledge and its regeneration are considered by firms as “key factors for the maintenance of a durable competitive strength and the improvement of its innovation capabilities” (Cohen & Levinthal, 1990, p. 128).

3.3) Industrial district as a cognitive and rational system

The analyses made by the district literature, whose interpretative roots are built around the work of many important Italian scholars such as Brusco, Rullani, Sforzi and Dei Ottati, have shifted their central viewpoint based on the Marshallian definition to a more elaborate explanation of the industrial district, which is interpreted both as a cognitive and rational system as well as a local innovation system. In particular, with the first interpretation it is underlined the propensity of this local productive model to share specific values, technical languages, skills and competencies within its social and

economic system and, in this way, create a distinct *collective identity* and a balance between cooperation and competition.

From the knowledge-based perspective, interpreting the industrial district as a cognitive and rational system means to define it as a “*meta-context* with both a dense concentration of knowledge production sites, that is, firm’s contexts, and also a high density of knowledge transfer channels which in their turn improve the processes of knowledge creation” (Camuffo & Grandinetti, 2011, p. 34). From this viewpoint, it is clear the importance of the *district-specific knowledge* and its generation and dissemination in relation to the competitive advantage of the local productive system. These peculiarities, that allow to operate dynamically and constructively, are translated into an increase in social cohesion among the economic agents such as to make the industrial district a local innovation system.

Before defining the aspects that portray the industrial district as a cognitive-rational system, it is important to point out that the localisation of firms in a bounded area does not always give as a result an industrial district. In fact, this is realised only when cognitive and decisional processes generated by firms go hand in hand in the same direction, creating, thus, a local system through the “formation of a common identity and the creation of auto-referential mechanisms that replicate it through space and time” (Rullani, 1997, p. 64).

In other words, the main condition that allows to generate a localised system of economic actors characterised by the sharing of same experiences and backgrounds is a collective identity that is interpreted as a tool to favour interactions and mutual trust. In this regard, the term collective identity indicates both the mutual sense of belonging to a group as well as, most importantly, the capacity to create a common technical language, which is the result of “a *self-referential process* able to translate the common context of experiences and identity of people into a specific system” (Testa, 2012, p. 56). Within the industrial district, this collective identity represents an intangible asset which is able to give meaning to tangible assets, and a vital source to make the cooperative and competitive interaction between agents efficient. Consequently, the industrial district can be interpreted as a system of social and economic processes that manages this intangible asset to create knowledge, social relations, and share specific competencies and experiences. This path of analysis underlines how the industrial district can be seen as a local system based on social interactions and able to create value through the local

accumulation of information, specialisation of competencies and limitation of firms' opportunistic approaches by using fixed conduct codes built on reputation and mutual trust between firms. In this regard, the result is the transformation of information and specific competencies from scientific knowledge to "what people are able to do" (Rullani, 1995). This kind of knowledge guarantees a high level of adaptation to external changes and it is strictly connected to human capital rather than the financial one, since it renews itself through social relationships. For these reasons, the population of firms inside the industrial districts can benefit from a considerable *pool of professional heritage*, characterised by both individual skills and propensity to cooperate and collaborate, which tends to regenerate itself through the socialisation among individuals (Dei Ottati, 1987). From this perspective of analysis, the Belluno industrial district's growth has been driven by a continuous enrichment of both technical knowledge and know-how that has allowed to reach unique levels of qualitative standards and design, becoming a clear example of a cognitive and rational system. In particular, both the dense intra-district flows of skills and competencies at the beginning of the industrial district's evolution, as well as the sense of belonging shown by the firms' employees have played an important role in favouring a higher mobility of the human capital among firms in the district.

Moreover, the development of numerous small manufacturing workshops has allowed to preserve and improve the know-how which characterises the Belluno local system, supporting the affirmation of the leading firms on the international markets. This last factor has allowed the acquisition of a *cognitive permeability* to the external environment, raising the technical level owned by the leading firms within their production processes. It is relevant to underline that the acquisition of different manufacturing capabilities outside the district's boundaries has given a higher awareness of the direction in which to move within the main target markets, improving the mechanisms which regulate the cognitive and rational system inside the Belluno industrial district.

For these reasons, the circumstances of development that characterised this local system have been the key of its survival and success over the course of time, as the pool of technical competencies, in fact, has been able to enlarge without losing its roots, hence becoming the driver for the generation of more competitive strength and added value to the firms' product.

3.3.1) The three forms of organisational learning

The generation and propagation of knowledge, both tacit and codified, are materialised through learning procedures. For this reason, these factors have to be interpreted as two phases of a “single innovation process” (Fischer, 2006, p. 174).

Although knowledge is irregularly distributed among the economic actors, its spreading guarantees the combination of different ideas and notions and increases the opportunities to have a vast pool of different competencies to innovate. According to this perspective, the exchange of different skills among the economic agents occurs until they become *common goods*; thereafter, a renewal of competencies becomes necessary, so that their subsequent exchanges can provide an added value to the firms. An important element to take into account in the learning processes is related to their nature of “decentralised processes for the knowledge dissemination” (Jovanovic & Rob, 1989, p. 569). When we contextualise this component inside the industrial district system, it becomes clear how critical the role played by both the leader firms and the local institutions is in the management of cognitive dynamics, both internal and external to the local productive system. In particular, concerning the external environment, these actors are focused on the acquisition of specific codified competencies to combine them with those existing inside the local heritage of knowledge. In contrast, in relation to the local area, their role is mainly dedicated to the efficient development and sharing of technical skills and capabilities.

In recent years, the attention towards the idea of *organisational learning* (OL) has significantly grown, producing a great many debates and researches on this topic (Bapuji & Crossan, 2004). Although a considerable variety of definitions is utilised to explain the concept of learning, for the purpose of this thesis it is necessary to read it in the light of the local agglomeration contexts in which it formalises.

Belussi and Pilotti (2002), in fact, through their study based on the numerous mechanisms of creation, diffusion and assimilation of knowledge inside the Italian local production systems, point out three main typologies of organisational learning.

The first type of organisational learning is called *instructive learning*, and it is related to the transmission of simple directives from the skilled employees to the apprentices through the intra-firm sharing of tacit knowledge, or it concerns technical specifications given to subcontractors.

The transfer of tacit knowledge occurs within the networks of production where firms “cooperate in interactions more or less at arm’s length” (Belussi & Pilotti, 2002, p. 10). The instructive learning does not generate relevant innovations, since the tacit competencies, capabilities and skills are kept alive through the emulation through the exchange of experiences and side to side job training.

The second typology of learning is the *absorptive learning*, that defines a process of knowledge acquisition. It concerns the creation of a more flexible organisational structure, with the purpose of improving the qualitative levels of goods and services mainly through the reduction of transaction costs. Furthermore, the absorptive learning is not exclusively concentrated on the growth and dissemination of tacit knowledge, it can include also fragments of codified knowledge. In particular, three main processes are included in this learning typology, also defined as “DUI mode” (Asheim & Parrilli, 2012, p. 44).

The first process is called *learning by doing*, and it is essentially the learning by making, by operating. In other words, this typology of learning can be expressed with the term “know-how”, since an individual becomes conscious of the necessity to know something and the way in which knowledge can be used (Arrow, 1971).

The second process of education, named *learning by using*, requires the active reworking of knowledge. In particular, there is a re-elaboration of the *mental schemes* acquired through the learning by doing (Rosenberg, 2008).

Lastly, we have the *learning by interacting*: it is a process that occurs with “the interaction among people inside a specific net of communication” (Morone, 2004, p. 87), favouring the possibilities to develop new solutions and ideas.

The third kind of learning is called *generative learning*, and it is activated through the economic agents’ relations within the industrial district allowing the creation of new knowledge: it is the most creative learning form existing in the industrial districts.

The economic agents are able not only to absorb external codified or tacit knowledge, but they can also activate generative processes to create new knowledge. This learning typology is typical of some Italian local productive systems characterised by a system of learning in which the existence of firms with built-in generative learning models has significantly improved the stock of existing knowledge through radical innovations.

The new knowledge that is generated has a tendency to be codified in the local technical language. Moreover, like adaptive learning, also the generative learning exploits both tacit and codified knowledge.

In the most dynamic local productive systems, the high levels of knowledge generation (both tacit and codified) take form in correlation to the increasing complexity of the industrial structure. In this regard, Belussi and Pilotti (2002, p. 23) created an evaluation scheme based on the typological traits of the Italian industrial districts from which emerge three key categories (Figure 2) built on their level of formalisation of contextual knowledge or, in other words, on the local knowledge at the basis of the productive system. The learning activities are set on the horizontal axis, and on the vertical one is placed the typology of knowledge which prevails within the industrial districts.

The first category comprises the local systems in which tacit knowledge between the economic agents prevails since this knowledge is embodied in the capabilities of the labour force, and the instructive learning characterises the behaviour of firms. For these reasons, the innovations generated by local firms are incremental, and the productive specialisation mainly concerns specific craft-based skills, such as the district of glass based in Murano and the knife district of Maniago.

The second group includes the local systems defined by a balance between tacit and codified knowledge, in which many economic actors possess knowledge absorption capabilities. In this group, firms are mainly concentrated on mechanical engineering sectors such as clothing and other traditional sectors.

Codified knowledge is highly developed compared to the first category of analysis, and there are more formalised innovation sources established in engineering and design areas which favour the product innovations. Moreover, firms are characterised by a constant flow of absorption of the external knowledge which they principally utilise for the product innovation.

Knowledge socialization is not only improved with informal mechanisms of learning through apprenticeships, but also through local universities, training schools or specific services tailored for small local firms by local authorities. This typology of productive systems includes the Vicenza district of jewellery, the Carpi district of knitting and clothing and the Manzano district of chair production.

The third category refers to some high-tech districts, or those districts specialised only in particular high value-added phases, such as for example industrial design and fashion.

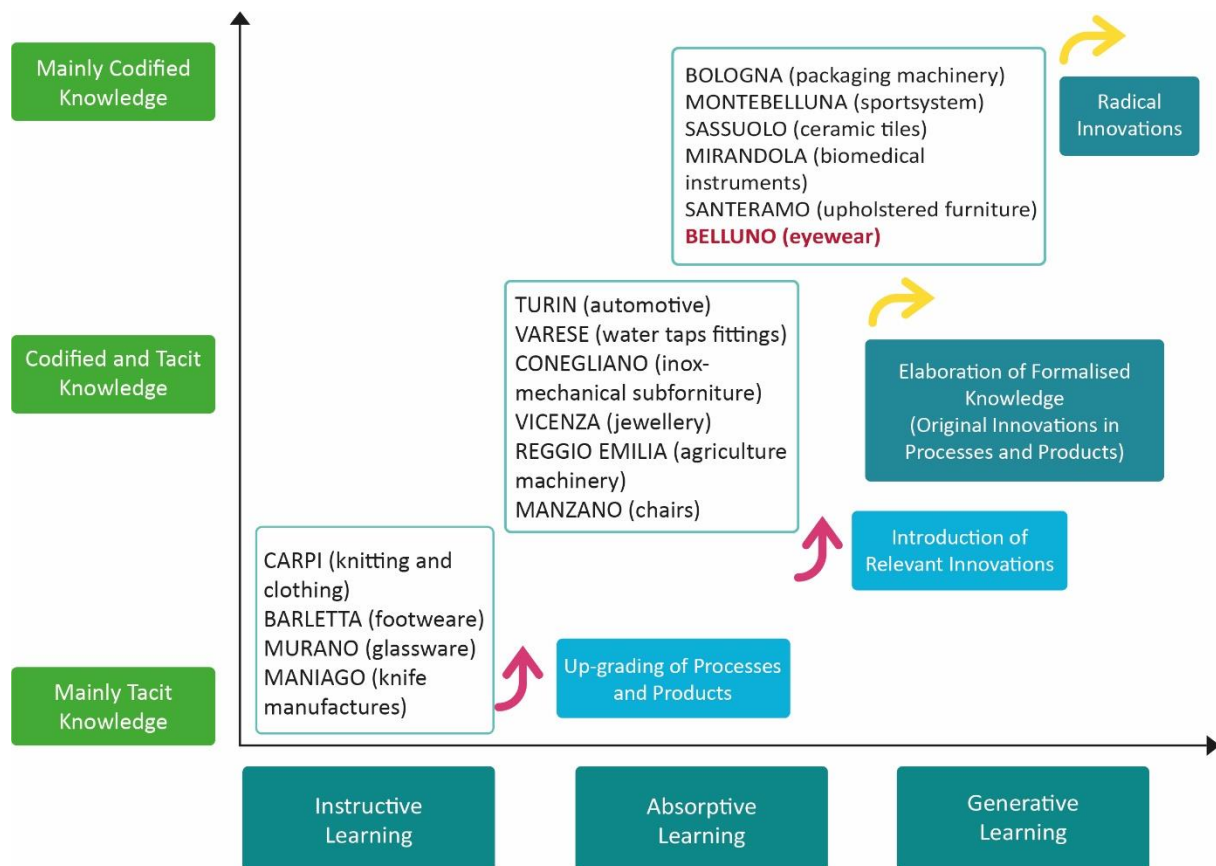
Even if tacit knowledge plays an important role, this typology of local productive system, is characterised by the predominance of codified knowledge, which is relatively developed and, hence, favours the creation of new knowledge.

Clearly, not all the firms located inside a district can be considered as knowledge generating firms, since only some strategic economic actors are strongly innovative (research centres within the district, universities, dynamic leading firms and some specialised suppliers). In particular, these industrial districts are characterised by many leading firms (Luxottica in the case of the Belluno local system) or institutions that favour the activity of knowledge creation, which in its turn increases the local stock of knowledge in the district, supporting the formation of radical innovations.

Knowledge is developed through the generative learning and numerous local organisations play the role of *knowledge meta-organisers*, since, on one hand, they provide the support through specific services to improve small and medium-sized firms' innovation processes; on the other hand, they coordinate the productive processes of local firms, managing the interrelationships between these firms both inside and outside the local agglomeration.

Concerning the Belluno industrial district case, the role played by Certottica in providing a continuous renovation of knowledge has been fundamental to the affirmation of the district in a global economic panorama and in the improvement of the innovation processes of each local firm. Some examples of these local productive systems are given by the packaging machinery district of Bologna, the sportssystem district of Montebelluna, the biomedical instruments in Mirandola, and the eyewear district in Belluno. Concerning this last example, it is essential to underline that in addition to codified knowledge, the know-how has been one of the crucial factors of the Belluno local system's success. In fact, the creation of eyewear that is qualitatively incomparable with those produced by other industrial contexts outside this local Italian system derives from the pool of technical abilities and experiences carried by the Italian eyewear's manufacturers. Consequently, this industrial district case is particularly interesting because it integrates the use of both tacit as well as codified knowledge on a very similar level to create mainly radical innovations.

Figure 2: Characteristics of Italian industrial districts in relation to the typologies of knowledge and the implementation of learning strategies



Source: Belussi & Pilotti, 2002, p. 23

3.3.2) The S.E.C.I. model

As previously underlined, each firm exploits both tangible and intangible sources; for this reason, the management of knowledge represents an integral part of the strategic approach in order to gain an advantage over competitors.

Nonaka and Takeuchi (1995), two of the most important pioneers concerning the importance of knowledge within organisations, stress the role of knowledge generation and application as fundamental elements in the success of a company. In fact, an organisation, which has the capability to create a growing flow of knowledge, possesses the distinctive capacity of “being dynamic” (Mitchell & Boyle, 2010, p. 67).

It is relevant to underline that from the last part of the 1990s, the focus on knowledge analysis has changed towards the examination of the sources of its creation. In this regard, Nonaka and Takeuchi (1995) give a significant contribution with their *Knowledge Creation Theory*, that has been improved by numerous contributions from their collaborators (Nonaka & Konno 1998; Nonaka & Toyama, 2007), through the *S.E.C.I. Model Knowledge Creation Spiral*, which combines the knowledge transformation process called S.E.C.I. with the context (*Ba*) for its generation (Figure 4). The structure of this model is based on the firm's *Resource-Based Theory*, in which the tangible sources are replaced with those intangible, and all the quantifiable operations are substituted with intangible processes. In other words, this model highlights the significance of knowledge context and some specific circumstances inside an organisation, individual or group, in which knowledge shifts from tacit to explicit to tacit in an uninterrupted *spiral of knowledge creation* (Nonaka, Toyama, & Konno, 2000), creating new knowledge within the organisation.

From the theoretical perspective, the S.E.C.I. model (Figure 3) has two dimensions of analysis: *epistemological* and *ontological*. The first one defines the transformation from tacit knowledge to explicit knowledge and vice-versa. The ontological dimension represents the individual, group, organisational and inter-organisational level of knowledge obtained from the conversion of tacit to explicit knowledge, or from explicit to tacit knowledge. Additionally, the whole organisation may spread knowledge inside its operational environment, defined as "knowledge ecosystem" (Bratinau & Orzea, 2010, p. 47).

The epistemological dimension comprises four stages, that denote the dynamics in which knowledge is generated and shared: *Socialization*, *Externalization*, *Combination* and *Internalization* (S.E.C.I.).

The first stage, called Socialization, is focused on the dissemination of knowledge from *tacit to tacit*, and it is considered by Nonaka and Takeuchi as the most valuable knowledge transfer within this cyclical model, because it includes the hidden elements of knowledge that are generated at the individual level. In other words, it contains tacit knowledge.

The Socialization becomes the way in which individuals share their experiences and skills (apprenticeship), acquired through a direct exchange (face-to-face) of tacit knowledge and, hence creating a "common place or *Ba* in which it is distributed" (Nonaka & Konno, 1998, p. 43). At the organisational level, this concept is explored through the promotion

of the *best practices*, whose identification and transmission are “one of the most recent techniques applied in operational management to improve the firm’s adaptation process” (Bratinau & Orzea, 2010, p. 48).

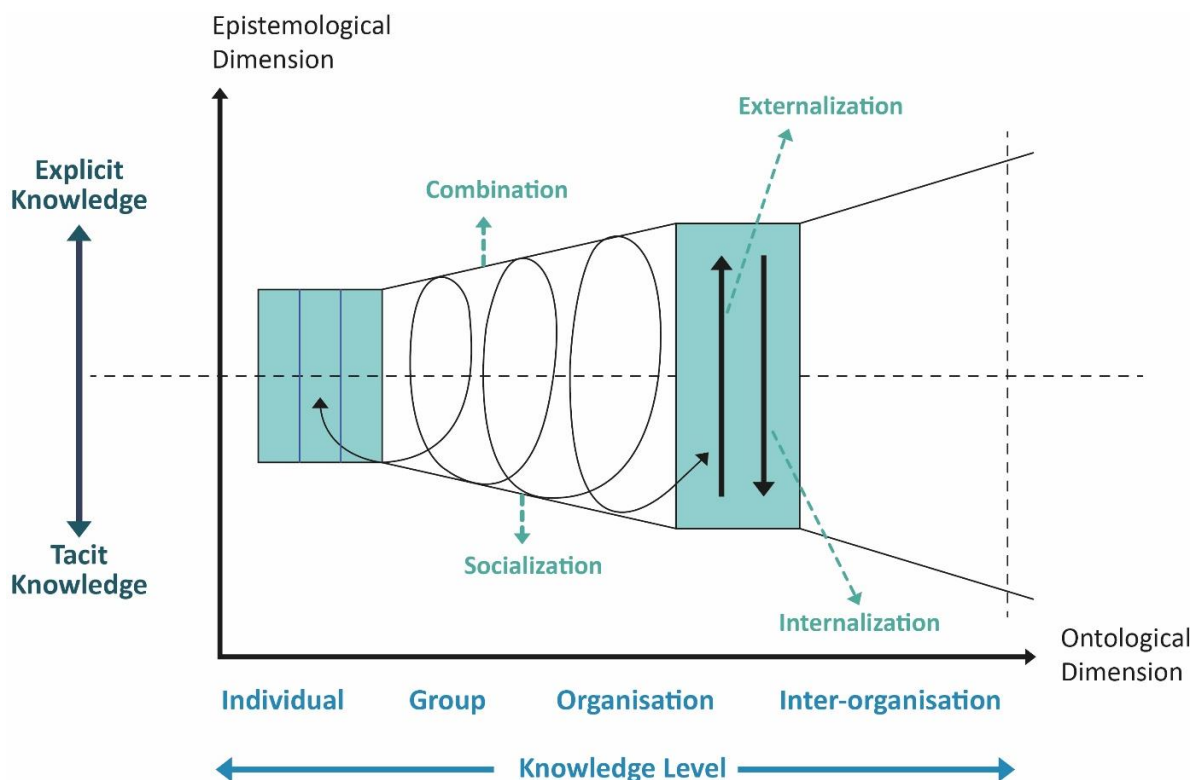
Once a specific space for the dissemination of knowledge is created, tacit knowledge becomes more elaborated, starting the second stage called Externalization: an individual process characterised by the transformation of tacit knowledge into explicit knowledge. Consequently, when knowledge becomes explicit it can be spread and disseminated to other people exploiting verbal and non-verbal expressions and becoming “the key to create new, explicit notions from the tacit knowledge” (Nonaka, Toyama, & Byosière, 2001, p. 495).

Nevertheless, the Externalization stage is an extremely personal process, and the achievement of knowledge conversion can vary on the basis of the application of specific cognitive models and metaphors. Moreover, it is important to underline that, whereas tacit knowledge is a tricky and problematic element to evaluate, explicit knowledge can be easily estimated, since it is defined through concrete data, rules, operative procedures and information. The Externalization becomes a process through which “the *entropy* of knowledge is reduced through the configuration and incorporation of new generated knowledge into the cognitive systems, characterised by an existing explicit knowledge” (Juceviciene & Mazaliauskiene, 2013, p. 206).

When the externalised knowledge, which derives from other different actors, is articulated, it can be combined, starting the third stage of the S.E.C.I. model called combination. This phase is characterised by the transformation of “the explicit knowledge into more intricate sets of explicit knowledge” (Nonaka & Konno, 1998, p. 44). In contrast to the Externalization, which is a merely individual process, the Combination phase is mainly a social process based on the transmittable features of explicit knowledge (databases, business intelligence data). Moreover, the Combination process only occurs when there is a specific organisational context, and therefore it is intrinsically connected to the concept of *Ba*. The final step of the conversation process is named Internalization and it is an individual process. Agreeing to Nonaka, Toyama and Byosière (2001), “Internalization concerns the process of incorporating explicit knowledge as tacit knowledge and hence, it is strongly related to learning by doing [...]. Internalised knowledge is utilised to extend, broaden, and re-frame organisational members’ tacit knowledge” (p. 497). Consequently, knowledge is internalised through a process of

integration inside the already possessed knowledge, becoming mental models, experiences and know-how. This “new” internalised knowledge improves the level of *absorptive capacity* and, mainly, the level of the individual knowledge. This last step closes the knowledge creation spiral process, beginning a new stage of knowledge creation within the organisation.

Figure 3: The spiral of organisational knowledge creation (S.E.C.I. model)



Source: Nonaka & Takeuchi, 1995, p. 73

3.3.2.1) The concept of *Ba*

The core element of the S.E.C.I. model is the idea of *Ba*⁵. According to Nonaka and Toyama (2007), “it represents the contexts and the meanings that are communicated and created through social relations which arise in a specific space and at a precise time” (p. 23). Therefore, since the four stages of the S.E.C.I. model require a definite context of meanings

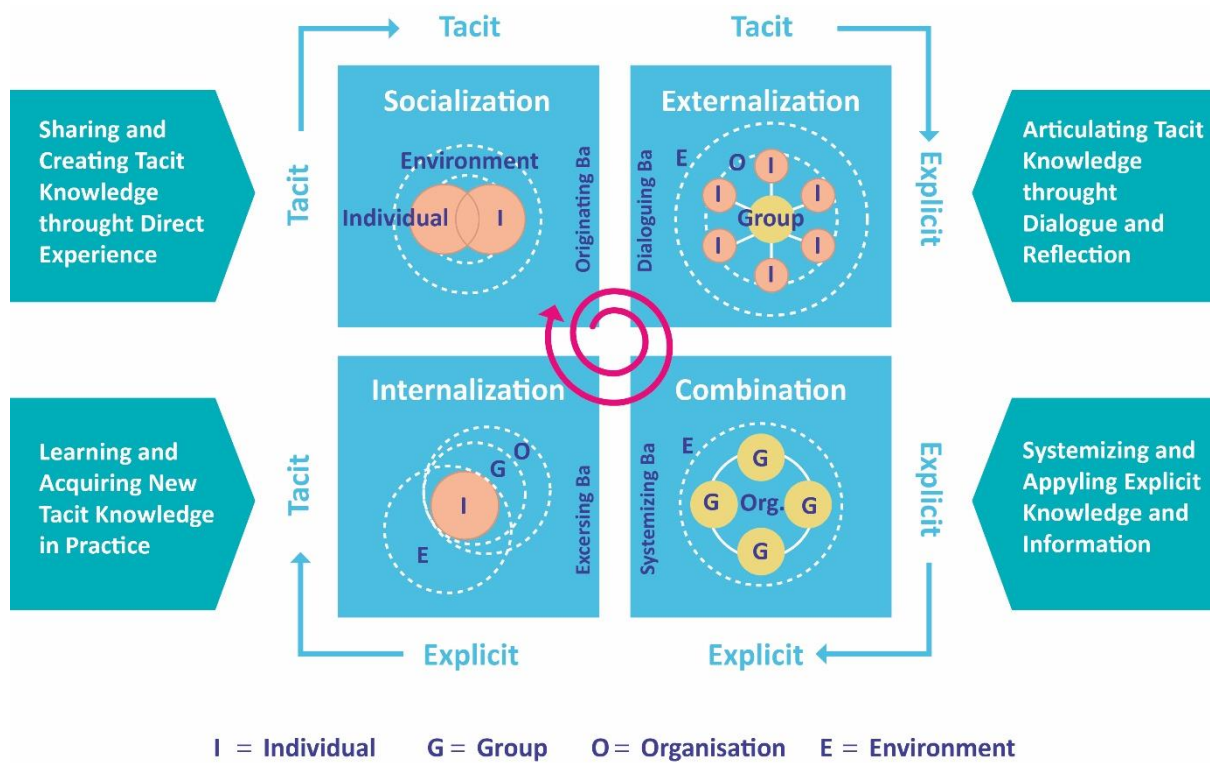
⁵ *Ba* is the term to indicate the word “place” in the Japanese language.

and same knowledge flows in order to work, Nonaka and Konno (1998) define *Ba* as the physical (office, business space), virtual (videoconference, digital platforms) and mental (shared ideas, models and experiences) space, or any combination of them, in which social interrelations between different actors take form, and allow them to share, combine and generate knowledge.

As we can see in Figure 4, Nonaka and Konno (1998, p. 43) identify four categories of *Ba*, correlated to the different stages of the S.E.C.I. model, which represent the cognitive platforms within the spiral of knowledge creation. In particular, they are characterised by two typologies of interactions: the first one consists of the forms of relationships which can occur individually or collectively. The second one corresponds to the exploitation of the means of communication in those interactions, which can be face-to-face or virtual interaction approaches.

The first *Ba*, called *Originating Ba*, is characterised by individual and face-to-face interactions. It is the space in which people share feelings, experiences and cognitive processes providing a context for the Socialization stage, because the face-to-face interaction represents the only path to obtain the overall range of the *psycho-emotional reactions*: key elements in disseminating the tacit knowledge. Nowadays, however, knowledge can be generated without any physical contact by using internet technology: individuals can share information via numerous *media*, like platforms, e-mail, phone calls. The second *Ba* is named *Dialoguing or Interacting Ba*, which is defined by face-to-face and collective interactions. It represents the place where mental models and capabilities are shared and transformed into specific terms and concepts. Consequently, it denotes the context (cross-functional teams, task forces and project teams) for the Externalization phase in which individuals' tacit knowledge is spread and expressed through dialogues among the participants of a specific group or team. The third type of *Ba*, *Systemizing Ba*, is characterised by collective and virtual interactions. It provides the context (meetings, online networks, database platforms) for the Combination of the existing explicit knowledge within the organisation, hence it represents the context of the Combination phase. The last typology of *Ba*, called *Exercising Ba*, is characterised by individual and virtual interactions, and thus, it represents the context (learning with senior experts on job trainings operations) for the Internalization stage. It can be considered more of a learning process in each individual, since it permits the conversion of explicit into tacit knowledge.

Figure 4: Correlation between the typologies of *Ba* and the phases of S.E.C.I. model



Source: Nonaka & Konno, 1998, p. 43

By correlating the concept of *Ba* to the division of labour among firms within an industrial district, it is possible to identify another typology of *Ba*, which can be defined as “Distrectual” *Ba*. In particular, this other form of *Ba* can be classified as “the context of relationships among the numerous firms inside the district, which supports and enables the creation and transfer of new knowledge among them” (Testa, 2012, p. 69). For this reason, in contrast to the Interacting *Ba*, the “Distrectual” one is characterised by the extension of the operating context beyond the firms’ organisational borders, allowing the connection between the different typologies of *Ba* owned by each firm inside an industrial district. Therefore, it becomes clear how an industrial district comprises the three elements (physical, virtual and mental) which define *Ba*. In fact, this local productive system is characterised by a physical context, since all the economic actors operate and collaborate in the same local area; it is defined by a mental context because the key element in this local productive system is the sharing of specific experiences, skills and know-how related to the industry of reference. Finally, it is delineated by a virtual context, since the process of innovation is strongly supported by the technological evolution, as

well as mechanisms of interactions based on the sharing of information through means of virtual communication spaces. Therefore, the industrial district model represents a concentrated form of *Ba*. In fact, this local economic system can be defined through the four logical categories which identify the concept of *Ba*. This analogy is easily verifiable by taking as an example the Belluno eyewear district. In detail, the Originating *Ba* is represented by the economic actors that share skills, capabilities, experiences through the sharing of tacit knowledge. In this respect, in the Second Chapter was underlined the key role of many local institutions (Certottica, ANFAO, *Politecnico Internazionale dell'Occhiale*) and leading firms (Safilo, Marcolin) in creating adequate conditions for the socialization of tacit knowledge, which favours the development of creativity and ideas for the design of eyeglasses. Moreover, the Belluno industrial district takes the form of Interacting *Ba*, since this productive system represents the specific socio-economic environment where the agents within it interrelate, creating mechanisms of interaction for the externalization of tacit knowledge, mainly through the collaboration between firms and many projects organised within the education institutes of Veneto Region with local organisations. The third typology of *Ba*, the Systemizing *Ba*, is expressed through the networks in which is it possible to combine the different forms of explicit knowledge deriving from the transformation of tacit knowledge into concrete forms, such as the eyewear prototypes, the use of particular components in their production and the adoption of specific machinery for the production of glasses. Inside the Belluno eyewear district numerous firms use many tools as electronic platforms through which members can exchange the necessary data or answer each other's questions to disseminate and collect knowledge efficiently and effectively (Savi, 2020). In detail, in recent years Certottica has driven the sharing of codified knowledge through several projects among district's firms with the purpose of expanding the pool of competencies within the industrial district, favouring the production of eyewear strongly characterised by uniqueness, design and innovation. Lastly, the Belluno eyewear district case represents the context in which the Exercising *Ba* takes form since the formalised knowledge, from the Systemizing *Ba*, is mainly translated into industrial products and training programs. In this regard, the human resources within the district embody explicit knowledge principally through the concept of learning by doing, apprenticeship activities and experiments, that in their turn create the conditions to acquire new tacit knowledge in practice, restarting the spiral of knowledge creation.

3.4) Industrial district as a local system of innovation

In the previous paragraphs, it was highlighted how the industrial district can be interpreted as a cognitive and rational system, whose peculiarities derive from the management of knowledge.

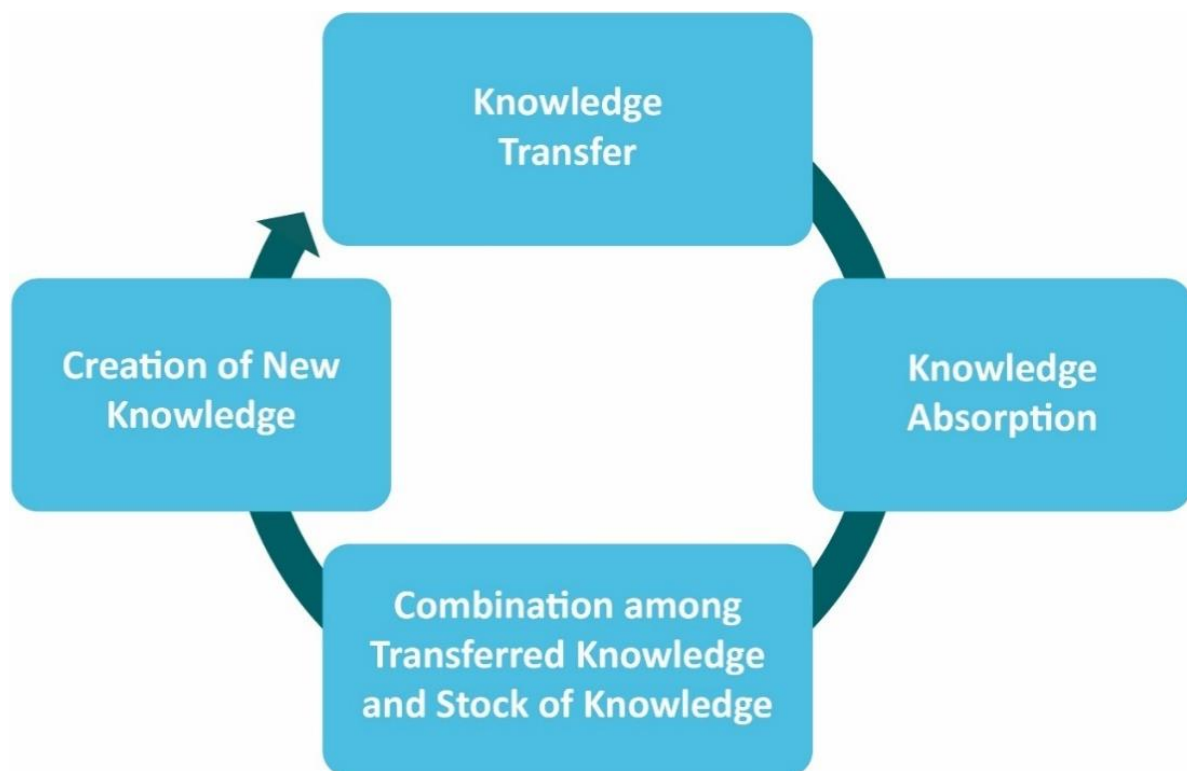
From a general viewpoint, in supporting the classification of the industrial district as a cognitive laboratory, it is essential to underline its capacity to operate as a meta-context. Hence, when the cognitive processes of this local system are able to create new knowledge, it is generated an innovation process that allows the configuring of the industrial district as a local system of innovation.

In recent years the attention to the economic development and innovation in a local dimension perspective has increased, encouraged by numerous debates concerning the importance of industrial districts inside the economic and social system of a country. Several studies and researches have contributed to give solid bases of analysis that underline the objective of district firms to maximise the value of their organisational competencies through the exploitation of specific processes which manage the flows of knowledge, and that in their turn drive the process of innovation (Vaccaro, Jansen, Van Den Bosch, & Volberda, 2012).

This local productive system has specific environmental factors to promote innovation, which are represented by both the close geographical proximity of firms and local institutions as well as the tight relationships among the agents involved, that in their turn reinforce the competitive strength of the whole industrial district (Stiglitz & Greenwald, 2014). Consequently, an industrial district can survive, replicate its distinctive peculiarities, and continue to work as a local innovation system if it maintains its function of knowledge generator. In this regard, in the next sections we will examine the phases of the innovation process inside the industrial district, and how these relate to each other in order to create adequate conditions for the generation of new knowledge in a cyclical process.

As it is shown in Figure 5, Camuffo and Grandinetti (2011) analyse the mechanisms which manage the transfer of knowledge, the conditions that regulate its absorption and its combination with the stock of knowledge, and lastly the circumstances that allow creating new knowledge.

Figure 5: The cyclical process of innovation within the industrial districts



Source: Camuffo & Grandinetti, 2011

3.4.1) The components of knowledge transfer

Since the innovation concerns “the generation, distribution and utilisation of knowledge” (Robertson, Jacobson, & Langlois, 2008, p. 1), the efficiency with which knowledge is transferred among parts represents a strategic factor in supporting the firm’s advantage over competitors.

The concept of knowledge transfer takes its roots in the studies made by Cohen and Levinthal (1990), who highlight the significance of this factor in supporting the firm’s capability to rapidly react to market’s changes and acquire competitive strength inside a specific industrial sector.

There are numerous definitions associated to knowledge transfer, also called the sharing of knowledge: in fact, it can be defined as a “process by which a group, division or department is influenced by the experience of other unites” (Argote & Ingramb, 2000, p. 150), or it can be defined as a systematically organised share of skills and information

among economic agents (Wong, Maher, Nicholson, & Bai, 2003). Although different notions may be used, from the economic point of view these have as common denominator the capacity to efficiently share knowledge in order to acquire cognitive resources to rapidly innovate. This mechanism of knowledge transfer (Figure 6) involves the combination of two factors: “*interpretative system* and *information system* that are respectively associated to a conceptual and operational perspective of examination” (Albino, Garavelli, & Schiuma, 1998, p. 54).

From the conceptual point of view, the transfer of knowledge is linked to the concept of learning organisation. In fact, the information transmitted becomes knowledge only when there is an interpretation process activated by the receiving user (organisation or individual). For this reason, this process depends on the stock of knowledge owned by the receiving user.

From the operational point of view, the transfer of knowledge is a communication process through information processing activities. In detail, the knowledge possessed by an actor (organisation or individual) can be shared with another actor through information flows carried by appropriate media.

Since knowledge transfer is a learning process, it can be divided in various phases, characterised by increasing degrees in which information is internalised by the receiving user. Hence, Gilbert and Cordey-Hayes (1996) have created a conceptual framework to track the transfer of knowledge within an organisation. In particular, they identify five fundamental steps.

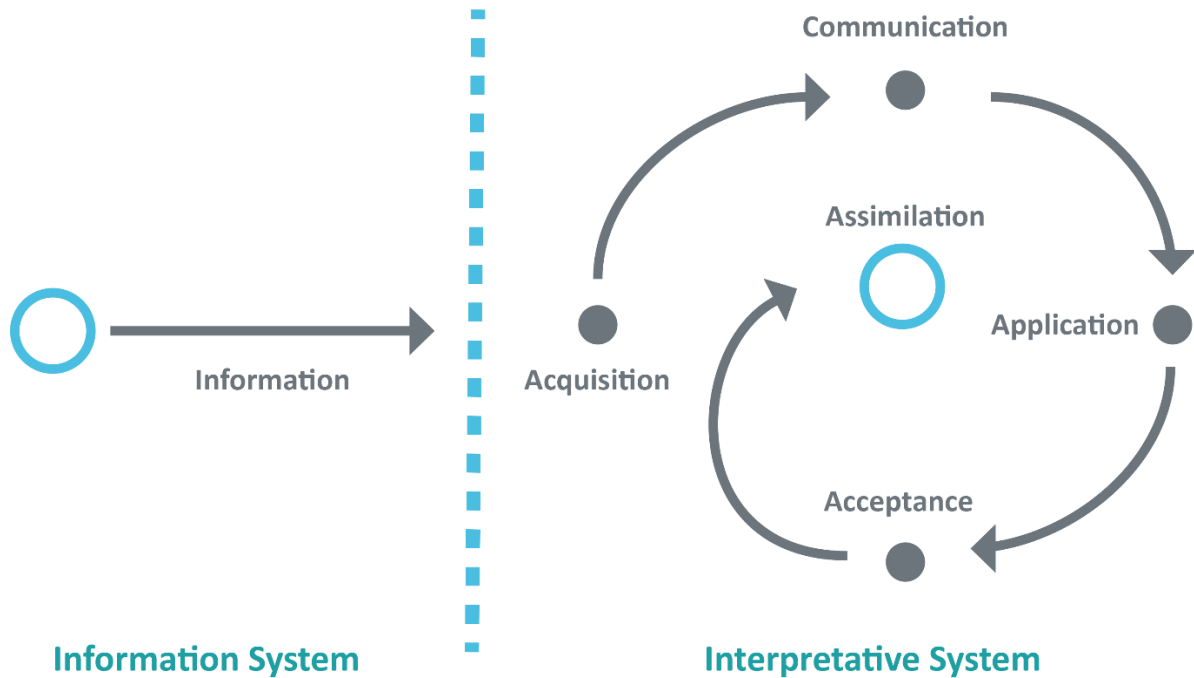
The first one is *acquisition*, that is related to the information acquisition from another organisation. The second step is *communication*, and it concerns the distribution of the information assimilated inside the organisation.

The third stage is *application*, through which the information, once it is acquired and communicated, it is applied in the organisation.

The fourth step concerns the *acceptance*, which is related to the individual acceptance of the applied information.

Lastly, the fifth stage is *assimilation*, that characterises the process of *cumulative learning*, creating changes in employees’ skills and organisation’s routines since it is a direct result of the use of the acquired knowledge.

Figure 6: The components of the knowledge transfer process



Source: Albino, Garavelli, & Schiuma, 1998, p. 54

By following the perspective of examination at the basis of the knowledge transfer process, Albino et al. (1998) identify four key elements which influence the efficiency of the knowledge sharing between two or more actors.

The first element concerns the *actors* (individuals or organisations) involved in the sharing process, who have to be characterised by *openness*, defined as “the attitude of one actor to share all the knowledge possessed facilitating the learning process” (Wathne, Roos, & Von Krogh, 1996, p. 61); by *trust* in terms of collaboration between actors to support inter-organisational learning and knowledge transfer processes (Dodgson, 2020); by *prior experience* which impacts on the capability of each actor to convey knowledge through information and, thus, internalise new knowledge. In this regard, the economic agents inside industrial districts perfectly embody these features guaranteeing an efficient knowledge transfer since they share the same contextual knowledge in a condition of general cooperation and interrelation.

The second element is the *context* in which the transfer occurs, that can be both internal and external to the firm. The internal one is represented by the *organisational culture*, and it depends on the absorption and transmission capability of the learning

organisation (Seaton & Cordey-Hayes, 1993). The external context is the set of conditions where inter-organisational interactions take place, and it is affected by both the market's characteristics in which the firm operates, as well as the industrial atmosphere within the industrial district, which is interpreted as a combination of inter-organisational variables, such as socio-cultural aspects and cooperation among firms. These two contexts affect each other, conditioning the efficiency of the transfer of knowledge: for instance, firms that operate and cooperate in the same industrial atmosphere (external context) have a tendency to present similar organisational cultures (internal context), guaranteeing favourable conditions for the transfer of knowledge. This is particularly true in the Belluno eyewear district, since the several interactions between different firms and local institutions, combined with the specific socio-cultural characteristics of the local area, promoted the growth of a similar entrepreneurial culture in all the industrial district firms. The third factor is the *content* of the knowledge transferred among district actors, which is identified as "the capacity to perform a particular task" (Albino, Garavelli, & Schiuma, 1998, p. 56). There are two categories of content: *instrumental* and *cultural*. The first one is the knowledge required to coordinate or to carry out a job. The aim of such a typology of knowledge transfer can be the enhancement of the organisations' operational capabilities: hence, the task correlated to this knowledge can refer to individuals' capability, technology and product knowledge, inter and intra-organisational rules. The second one is the capacity of knowledge of creating a particular organisation's cognitive background. It comprises organisational beliefs and values, the actors' cultural background and the language used in the organisation to communicate: therefore, its task is the improvement of the understanding capacity of the district actors involved in the knowledge transfer process.

The last element of analysis is the *media* that can be defined as every useful means for the transmission of information and data. In detail, media "are influenced by their *capacity* and *richness*, from which the efficiency of knowledge transfer depends" (Albino, Garavelli, & Schiuma, 1998, p. 57). The media capacity is the ability of processing information from the quantitative and qualitative perspective, in other words, without redundancy and gaps of information. In particular, these media depend on forms, rules, procedures, and use mainly impersonal fonts, such as numeric and written data, documents and databases. The media richness represents "the ability of making the change of actors' mental representations easy within a specific interval of time" (Daft & Lengel, 1986, p. 565). In

this regard, the richness of media is influenced by three key communication characteristics: “the capacity to facilitate rapid, two-way feedback; the capability to handle multiple information cues at the same time; the ability to create a personal focus for the communication” (Daft & Marcic, 2013, p. 203). In detail, the media which are characterised by a high level of richness are personal and involve face-to-face and team-based interactions (workshops, business meetings), “since the knowledge sharing is favoured by communication processes with the lower level of ambiguity” (Sreckovic & Windsperger, 2011, p. 301). Consequently, at the intra-organisational level, personal interactions among the actors involved in the transfer of knowledge are preferred to reduce the uncertainty of the content and the time of sharing.

The concept of knowledge transfer has been addressed in numerous studies in the economic literature over the course of time, mainly concerning the local agglomeration (Grandinetti & Tabacco, 2003; Easterby-Smith, Lyles, & Tsang, 2008; et al.). However, the common denominator at the basis of the sharing of knowledge is the spatial proximity among the actors involved. In particular, the efficiency in terms of innovation relies on the creation of a homogeneous cultural environment characterised by a mix of cooperation and competition and a high level of common technical knowledge “which increase the absorptive capacity of each district firm” (Dahl & Pedersen, 2004, p. 1679). Besides these factors, Von Hippel (1987) and Rogers (1982) consider the firms’ relationships based on *mutual exchange* as a fundamental condition of an efficient sharing of knowledge, because it improves the stock of knowledge of each receiving user. Moreover, this dissemination of information favours the reduction of transaction costs thanks to the development of a common language of interaction.

3.4.1.1) The transfer of knowledge among district firms

After describing the main elements of the first phase which characterises the innovation process, the analysis will now go into detail focusing on how the inter-firms transfer of knowledge is achieved within the industrial districts.

There are three key activities which, originating at the intra-district level, give rise to the mechanisms of inter-firms knowledge transfer (Figure 7): “direct observation of artefacts and actions aimed at imitation; high level of human resources mobility between local

firms; and intra-district relations” (Camuffo & Grandinetti, 2011, p. 36). When these activities are efficiently implemented at the organisational level, they allow a reduction of the information costs and guarantee an improvement of the coordination among the different firms’ areas.

Figure 7: The mechanisms of knowledge transfer among district firms



Source: Camuffo & Grandinetti, 2011, p. 36

The first process of knowledge transfer mainly regards “highly innovative products and activities” (Grandinetti, 2002, p. 188) and the corresponding products’ imitations. In particular, a new product is an artefact which comprises both tacit and explicit knowledge. Hence, both the finished product as well the marketing activities represent the explicit knowledge utilised or created in the process of development of the new product, that could be more *tacit* or *semi-explicit*. Simultaneously, knowledge which is initially tacit converts to less *tacit*, since it gains visibility through the artefact. For this reason, the imitative observation has to be able to absorb the largest possible amount of knowledge enclosed in the product, through a “reverse engineering process” (Camuffo & Grandinetti, 2011, p. 36), in order to obtain the greatest benefit from the process of imitation. Obviously, the higher the level of tacitness in the innovations or activities, the more difficult their imitation will be (Reed & De Fillippi, 1990). Imitative behaviours are numerous inside an industrial district, both because they are the consequence of the spatial proximity of firms, but also since they are the result of mechanisms of balance between cooperation and competition. For instance, inside the Belluno industrial district, there are numerous examples of imitative behaviours, mainly in relation to leading firms’ production machinery or eyewear models, both because eyewear artefacts are

considered “easy” to produce, and since the success of a specific eyewear model leads many other firms to replicate it in order to obtain the same market success and innovate their production processes.

The second mechanism of knowledge transfer concerns the mobility of human resources among district firms, that can be interpreted as “both *knowledge carriers* as well as *knowledge incubators* in much the same way as artefacts” (Camuffo & Grandinetti, 2011, p. 37). In particular, people embody both tacit and explicit knowledge concerning every activity in the value chain of the firm. Hence, the tacit knowledge embodied by an employee is transferred when he chooses to change his job. In this regard, when the corporate environments of origin and destination have a certain degree of *cognitive juxtaposition*, this tacit knowledge can be activated by the owner or transferred through imitative behaviours or direct communications to other people, becoming explicit.

The competencies collected inside an industrial district are characterised by *district-specific* features, which are related to the context in which they are created and shared. For this reason, the innovations can be easily spread within the district socio-economic environment instead of being disseminated outside its boundaries. Thus, the improvement of human capital, as it was underlined in the Belluno case study, is a key factor in the firms’ growth and in the exploitation of opportunities to innovate. The transfer of knowledge can also occur as the result of inter-organisational and inter-personal relations inside the industrial districts.

In the case of inter-firms relations, there are two typologies: *direct* and *indirect*. The first one includes the *vertical relationships* among firms which belong to different phases of a unique productive chain (buyers-suppliers) or, the *horizontal relationships* in the case in which they operate in similar phases of the productive chain.

The second type of relationship regards the transfer of knowledge between two firms which are not directly linked, but they share a relation with a third common subject because the network of the district is composed by nodes that work as “cognitive relays” (Grandinetti & Tabacco, 2003, p. 3). In fact, as in the case of Belluno industrial district, all the firms rely on Certottica to carry out the quality tests on their products and obtain the adequate certifications to introduce them into the market. It is also relevant to highlight the inter-personal relations within the industrial districts, especially when individuals work inside two different firms that are not linked by established relationships. In fact, in some circumstances the knowledge owned by these people is shared, creating indirect

relations between the firms within the industrial district. The three mechanisms of knowledge transfer can be activated both separately as well as simultaneously: for instance, the probability of success of the firm's imitative behaviour increases if it is able to employ a human resource directly involved in the process of innovation of another firm. The exchange and accumulation of knowledge create the district's contextual knowledge which, being composed by both tacit and explicit knowledge, can be viewed as the result of specific circumstances, experiences and relations which influence the local productive system's growth and innovation. For this reason, the transfer of knowledge is strongly favoured by similar socio-economic contexts in which the economic agents operate and create knowledge. In particular, from a dynamic point of view, the spreading of knowledge enables the reduction of both the communications barriers as well as the transaction costs of information within the district. In the local process of knowledge transfer, not all organisations play the same role in managing knowledge. In fact, in industrial districts, the leader firms' growth, acting as strategic references for the other firms, as a result of their scale economies and capabilities, can generate relevant effects on the nature of knowledge and its transfer inside the districts. In contrast, the small firms, due to their low economic power, are positioned in the nodes of the district's network, in which it is possible to acquire only a very limited part of the knowledge flows created by leading firms.

Taking as reference the Belluno industrial district, it is possible to underline the role of the leader firms in modifying the nature of knowledge and its spreading in order to obtain a higher competitiveness in local as well as international markets. As stressed in the Second Chapter, the evolution of the district has been affected by some significant events. From a typical craftsmanship phase of origin, defined by many small firms operating inside a prevalently local final market with financial and logistic complications, this industrial district has developed and enhanced its competitive strength through the exports in international markets. The internationalisation process has taken place from the 1980s, the year in which Luxottica become a holding (Luxottica Group), principally as a result of Luxottica's setting up in Germany, United States, Asia of its first international subsidiaries, thereafter favouring its consecration as the world leader in the eyewear production. In fact, this internalisation and the relevant development of the district activities have been mainly determined by Luxottica's growth as a firm. The expansion of the leading firm in the foreign markets raised the necessity for the industrialisation of the

production process, in addition to more integrated customer-supplier relationships, attainable through a more efficient and effective process of knowledge transfer.

The purpose of improving both the suppliers' coordination as well as the production process efficiency has led Luxottica to deal with the process of *knowledge codification*. Through this process of codification and the resulting higher speed of knowledge transfer, Luxottica has been able to develop the acquisition processes of knowledge and its communication. In other words, this leader firm "has lowered the equivocality and uncertainty of the transferred knowledge-related tasks" within the Belluno industrial district (Albino, Garavelli, & Schiuma, 1998, p. 61). However, the codification of knowledge has also favoured the organisational and technical knowledge to design and produce eyewear more straightforwardly obtainable by the other district competitors, both small as well large sized-firms. For this reason, Luxottica has been forced to adopt strategies focused on limiting the knowledge dissemination and protect itself from the possible competitors' imitation. This has led the firm to adopt a verticalization of the production phases and the choice of specific suppliers and strategic agreements with selected local and international companies (for instance, for the creation of a new eyewear model or the acquisition of important market's share in a selected country).

The verticalization process is mainly focused at enhancing the coordination between Luxottica and its referring suppliers and at improving the hierarchy degree of this leader firm in order to reduce the number of potential knowledge transfer channels to the other industrial district firms. In this perspective, it seems that the action of Luxottica is very influential in the Belluno industrial district's evolution process, because of its ability to manage and modify the transfer knowledge processes thanks to its high hierarchy level. Nevertheless, it is essential to take into consideration the role played by the other local leading firms as Safilo, De Rigo and Marcolin which in these last years, together with important local institutions as Certottica and ANFAO, are reinforcing the relationships with many small and medium firms in order to create adequate conditions to take advantage of the knowledge transfer channels developed inside the Belluno industrial district and increase its relevance as a local system of innovation. In this regard, they are provided higher possibilities for the district's growth since all the agents which contribute to the improvement of the pool of competencies are taken into consideration, limiting, however, the transfer of codified knowledge when it could create strong disadvantage conditions in the competitive approach of these firms.

3.4.2) The absorptive capacity

The process of intra-district knowledge transfer is a relatively complex phenomenon in which “three *sub-processes* are involved in the effective sharing of knowledge from the *source* to the *receiver*” (Camuffo & Grandinetti, 2011, p. 37).

The first sub-process concerns the transfer of knowledge, intentional or not, to the receiver through one or many cognitive media. This sub-process is followed by the receiving of knowledge by the user involved in the transfer process. Then, the receiver starts the third sub-process characterised by the knowledge absorption. In other words, the *metabolization* of knowledge is carried out by the receiving user, that makes it available for use.

Since the absorption of knowledge is a learning process, it represents the most complex phase of the knowledge transfer, since the firms’ capability of absorbing this knowledge relies on the level of information complexity that constitutes it. Regarding this aspect, numerous scholars (Myers, 2009; Roos & Von Krogh, 2016; et al.) underline that knowledge complexity depends on its tacit nature: hence, the higher the level of tacitness of a process of innovation, the more difficult will be the imitation process and, in general, the transfer of knowledge. In this regard, the condition of tacitness does not imply that all the knowledge in this condition is destined to persist as tacit. In fact, as underlined in the previous paragraphs, tacit knowledge does not have the nature of being “irremediably sticky” (Spender, 1996, p. 47), although this could be the case of a very complex tacit knowledge that is impossible or too expensive to make explicit. Furthermore, when the tacit knowledge is possessed by individuals it does not require to be explicit before being transferred from one firm’s context to another. The mechanism involved in making knowledge explicit starts only later, in a possible transfer among people within the same context, through the communication and observation of actions and artefacts.

From the intra-district perspective, if on one hand, knowledge complexity limits the capacity of the firm’s absorption, on the other hand, this capacity depends on the cognitive features of the context in which it is received. In fact, this capacity allows to reduce the inhibiting effect of complexity which characterises its absorption. In other terms, the probability that knowledge is efficiently transferred depends on the level of the relative complexity of knowledge: that is, it is related to the cognitive structure of the context involved in its absorption.

The *absorptive capacity* (ACAP) is defined by Cohen and Levinthal (1990) as “the capability of a *firm* or *individual* to recognise the value of new, external information, assimilate it, and apply it to commercial ends” (p. 128).

The definition is later taken into consideration by Zahra and George (2002) in relation to the phases of knowledge absorption which composes it. In fact, they interpret the absorptive capacity as a fundamental factor for the firm’s innovation process. Since it can be generated in many ways, from the learning by doing to the investments in research and development, the absorptive capacity requires to be strongly developed to “both efficiently manage knowledge received, as well to forecast the innovation paths in order to acquire competitive advantage over rivals” (Zahra & George, 2002, p. 185). In this regard, the investments on research and development as well as those in the learning activities of human resources presuppose not only an improvement of knowledge creation, but also the development of absorptive capacity.

A key feature of the absorptive capacity is its dependency on the *prior related knowledge* which Cohen and Levinthal (1990) define as knowledge that “includes basic skills or even a shared language but may also comprise knowledge of the most recent technological or scientific developments in a given field” (p. 128). Hence, it is clear that the notion of prior related knowledge presupposes a logical interdependence between the context of knowledge generation and the context in which the receiver absorbs it. From this perspective of analysis, this interdependence can be read as the *cognitive proximity* of the two contexts (Nooteboom, 2000). Therefore, the firm’s absorptive capacity is correlated to the context’s cognitive structure in which it operates, and it is directly proportional to the cognitive proximity of the contexts in which operate both the source as well as the receiver. In other words, when the context of a firm is characterised by a cognitive structure very similar to that of the context involved in the generation of new knowledge, the absorptive capacity of the receiver is characterised by a stock of knowledge that enables the transfer process to be completed effectively and efficiently. Moreover, in the circumstance of cognitive proximity, the observation process may become an effective factor for the transfer of knowledge.

The importance of cognitive proximity is easily verifiable inside the Belluno industrial district, since the creation of specific industrial poles, mainly around the leading firms as Luxottica, Safilo and Marcolin, is determined by the exploitation of the local district firms of similar cognitive contexts to absorb new production and processing competencies, like

the use of a specific product material, the design of new glasses models, the introduction of a product machinery to reduce the time of production or to improve the quality of the eyewear.

Concerning the human resources inside district firms and their correlation with the transfer of knowledge, the element which supports and simplifies their absorption of knowledge is the *cognitive interaction*: the capability of human resources to interrelate through the communication which, consequently, leads to the intensification of the absorptive capacity, improving all the mechanisms of knowledge transfer described above. In this regard, for instance, within the Belluno eyewear district the local institutions as Certottica and Reviviscar create many learning activities and interaction projects for the human resources belonging to firms characterised by analogous cognitive structures in terms of technical knowledge and market's objectives, in order to create favourable conditions for the learning process and, hence, provide a targeted support that makes the knowledge acquired available for use. The knowledge transfer processes are, thus, the direct consequence of both the cognitive as well as interaction proximity. These two concepts allow to explain the high level of knowledge transfer inside the industrial districts and, most importantly, allow to motivate the conditions at the basis of the effective transfer of knowledge.

First of all, since industrial district firms can be classified in groups characterised by a *technological* and *productive homogeneity*, on the basis of their supply chain's phases and the typology of industry in which they operate, the cognitive distance between these groups is very short, since the level of prior related knowledge of each group compared to the others is maximised. Consequently the transfer of knowledge among these firms occurs efficiently and effectively. However, the cognitive proximity of firms characterised by supply relationships is very low because of their different productive structure. Nonetheless, they are able to efficiently transfer knowledge through inter-personal relation channels, on the condition that "they are characterised by cognitive interactions among the individuals involved" (Camuffo & Grandinetti, 2011, p. 40).

The second factor at the basis of the absorptive capacity is, thus, the cognitive interaction. This element, which is reflected in the *uniqueness* and *homogeneity* of the *socio-cultural environment* within the industrial district, comprises a set of specific and common

elements which Dei Ottati summarised in the notion of “community market”⁶ (2003, p. 77). This community dimension, interpreted by Becattini as a collective, immaterial and *district-specific* source, and at the basis of its definition of the industrial district as a socio-economic entity, both simplifies the establishment of cognitive interactions and also raises the probability of the conditions that favour it: relationships and inter-firm mobility of human resources. While this last one is less problematic thanks to the socio-cultural homogeneity, the inter-personal relationships are more frequent in the absence of relevant communication barriers.

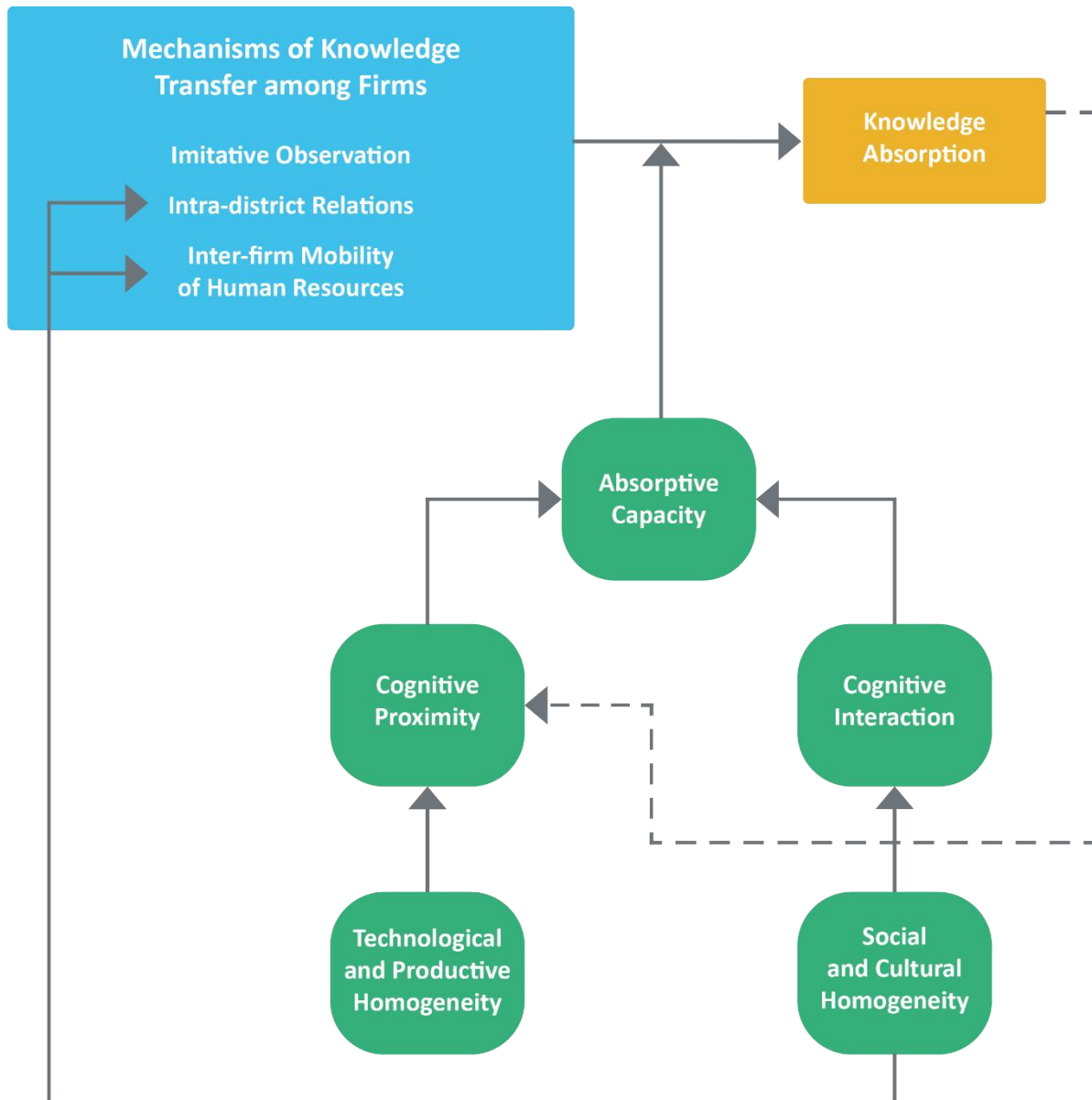
The homogeneity in both the socio-cultural environment as well as in technological and productive terms are traits which represent the Belluno industrial district. However, these two factors have to be taken into consideration keeping in mind the historical evolution of this district. In this regard, the two factors have represented the key aspects of its origin as well as its evolution until the process of internalisation of the leading firms that, in its turn, created a deterioration of the socio-cultural context and the increasing of the gap in productive and technological terms between these firms and smaller ones. Nevertheless, this condition of divergence seems to have gradually disappeared in these last years, mainly thanks to the determination of Veneto Region, local institutions and several leading firms to recreate in a more dynamic perspective the conditions to allow a homogeneous growth of the district both in sociological as well as in productive terms.

Figure 8 sums up the processes involved in the intra-district knowledge transfer analysed in these paragraphs, focusing on the mechanisms which are activated in relation to the absorptive capacity.

Firms are facilitated in absorbing the knowledge generated inside an industrial district thanks to the opportunities deriving from their cognitive interaction and/or the cognitive proximity. However, these two factors have to be related with not too similar firms’ operative contexts since the transfer of knowledge does not imply an improvement in the knowledge stock of the receiver.

⁶ According to Dei Ottati, the concept of community market comprises shared values and language, meanings and implicit rules of behaviour in common.

Figure 8: Knowledge transfer within the industrial districts



Source: Camuffo & Grandinetti, 2011, p. 42

3.4.2.1) The absorptive capacity's dimensions

Since Cohen and Levinthal defined the notion of absorptive capacity, this mechanism of knowledge absorption has assumed a high relevance in the economic literature in relation to the development of innovation processes inside firms and their knowledge management. Concerning the definition given by the two Authors, who identify three

dimensions (*acquisition, assimilation and exploitation*) at the basis of the absorptive capacity, it is clear how their interpretation mainly depends on the *prior related knowledge*, consequently investments into research and development are the central point of its development and the capacity of firm to acquire knowledge. After their analysis of the term, many scholars have begun to focus on the areas involved in supporting the organisation's absorptive capacity. In particular, Zahra and George (2002) reformulated the concept of absorptive capacity enlarging its framework of analysis into four dimensions and interpreting it as "a set of organisational processes and routines through which firms acquire, assimilate, transform and exploit knowledge to generate a dynamic organisational capability" (p. 186), through persistent and systematic routinised efforts. The definition comprises four dimensions of the absorptive capacity correlating them to two *supra-dimensions*, which operate in separate but complementary roles: the first one is the *potential absorptive capacity* (PACAP), defined as the firm's capacity to acquire and assimilate new external knowledge; the second one is the *realized absorptive capacity* (RACAP), interpreted as the capability to transform and exploit this new external knowledge. Based on this interpretation, it seems clear how the four processes that their definition displays underline the absorptive capacity's relevance in creating a dynamic organisational capability, and thus, the four dimensions of which it is composed directly impact on the sustainability of a firm's innovation process, making it easier to develop and redefine the *knowledge-based assets*.

According to the line of scholars who support the necessity to interpret the absorptive capacity from a dynamic viewpoint in terms of firm's growth and management of knowledge (Zahra & George, 2002; Lane, Koka, & Pathak, 2006; et al.) the four dimensions of absorptive capacity identified by Zahra and George, and displayed in Figure 9, cover exhaustively the interpretative kernel at the basis the analysis following this paragraph. For this reason, it is essential to explain them in detail.

The first dimension is the *acquisition*, defined as the "firm's capacity to identify and acquire the generated external knowledge which is essential to its operations" (Zahra & George, 2002, p. 189). In other words, knowledge acquisition can occur through interconnections developed with external units. Consequently, the co-existence of external and internal factors in knowledge acquisition becomes the key condition in the acquisition of knowledge. In this regard, become indispensable the firm's prior related knowledge, investments on research and development and mainly, the speed and

intensity of learning activities as “essential components which regulate the quality and degree of knowledge absorption capability” (Zahra & George, 2002, p. 189).

Inside the industrial districts not all the firms have the same capacity of acquisition. In particular, the level of efficacy of this dimension is mainly attributed to leading firms, which are characterised by a broad prior related knowledge and a more efficient *competitive scanning*. A clear example is given by the several relationships and agreements between Luxottica and other economic actors, both local as well as external to the Belluno district, in order to acquire specific manufacturing skills and technological competencies and improve its value chain. Secondly, the *assimilation* capacity denotes the “routines and processes that permit firm to analyse, interpret, understand and process the information acquired from external sources” (Zahra & George, 2002, p. 189). After obtaining knowledge from the firm’s external environments, the firm has to process it and develop the existing data and information into new *firm-specific knowledge*. This procedure is strongly affected by the prior related knowledge possessed by the firm which receives it, since for a firm it is difficult to acquire knowledge from an external user characterised by a very different stock of knowledge.

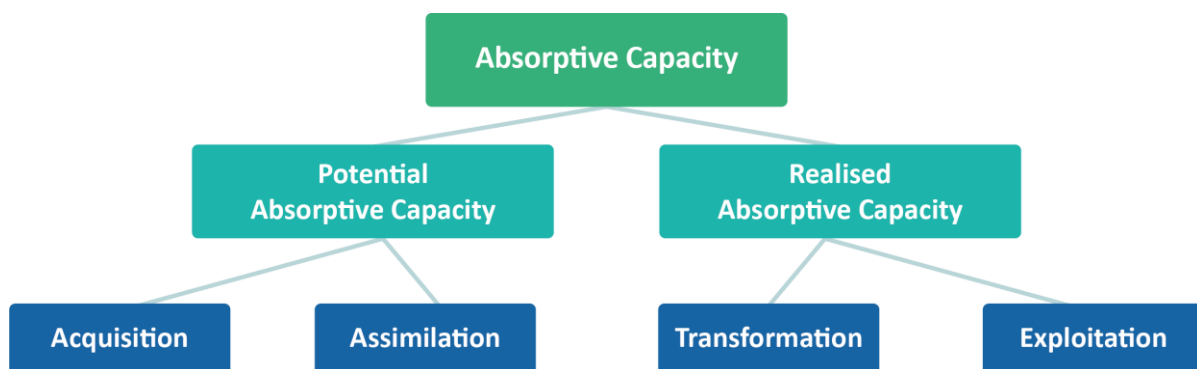
According to Zahra and George (2002), the key component of this capacity is the accuracy of the codification of knowledge, which affects the comprehension and learning abilities of the obtained knowledge. For this reason, the assimilation dimension operates as “a *translator* among the acquisition and transform dimensions, since it translates the knowledge acquired into a common language easier to understand” (Yan, 2014, p. 2).

The *transformation* dimension is the “firm’s ability to develop and refine the routines which simplify the combination of the existing knowledge, and the acquired and assimilated new knowledge” (Zahra & George, 2002, p. 190). In this dimension, firms can add, delete, transform and merge acquired knowledge in new means to produce “higher-value products and services” (Spender, 1996, p. 46) and create solid foundations to supplementary strategic behaviours and innovative ways of development. The elements of transformation capability are, thus, the conversion and internalisation of knowledge through its the recodification and *bisociation*⁷, to create new competencies and perspectives for the firm’s growth.

⁷ Perceiving of a situation or idea [...] in two self-consistent but habitually incompatible frames of reference (Koestler, 2014, p. 35)

The *exploitation* is the last dimension of the absorptive capacity, and it is based on the above described three dimensions. It refers to “the firm’s capability to use new external knowledge for commercial purposes and to realise its objectives” (Lane & Lubatkin, 1998, p. 466). In detail, this dimension is focused on extending, leveraging and refining the existing firms’ routines, competencies and technologies in order to build new procedures and schemes designed for internal operations. Consequently, the outcome of this phase has a long-term orientation which permits firms to take advantage over competitors in the long run. According to Zahra and George (2002), these elements are exploited to improve firms’ core competencies and support the assemblage of the absorbed knowledge. All these four phases allow firms to efficiently and efficacy manage internal and external changes, capabilities, information and skills to create adequate conditions to innovate.

Figure 9: The model of absorptive capacity



Source: Zahra & George, 2002, p. 192

3.4.3) The creation of new knowledge

The process of knowledge transfer involves different firms and consequently, distinct roles according to their importance inside industrial districts. In particular, it is possible to distinguish between leading firms, defined by large dimensions with an high propensity to invest on research and development, human capital, productive resources, becoming both the pioneers of innovations as well as the drivers of the changing conditions inside the local market; and small firms that, because of their economic dimensions, are

characterised by a lower level of investments on research and development, learning processes, improvement of machinery of production, assuming the role of receivers of knowledge and innovations generated by large firms (Belussi & Pilotti, 2002). Moreover, the analysis concerning the knowledge transfer processes leads to stress the reduced cognitive distance and similar homogeneity of socio-cultural as well as the technological and productive factors among the district firms to create efficient conditions of knowledge sharing. Although the evolution of industrial districts is strictly related to the innovations generated by leading firms, small firms are not excluded from the process of knowledge creation, because it involves the whole industrial district as it is characterised by a *diffused industrial creativity* (Bellandi, 2003).

The production of knowledge is not a mere function of the density of the sources of knowledge localised and involved in the same business area, nor it depends on the size of the population of firms, but it is affected by two key aspects.

The first concerns the *division of cognitive labour* among district firms focused on defined market segments, that is the vertical and horizontal variety of product and/or technological specialisations that allow to increase the opportunities to generate new knowledge. For instance, inside the Belluno industrial district there are several specialised laboratories and small firms specialised in producing specific parts of the glasses or in testing the most adequate materials for frames, that allow to amplify the range of typologies for the eyewear models.

The second factor regards the *idiosyncratic nature* of knowledge generation, since “district firms dealing with similar challenges and having same productive specialisation may develop distinct solutions” (Maskell, 2001, p. 928). Consequently, cognitive heterogeneity is supported by many factors which favour the decentralisation of tacit knowledge. In this regard, individuals, given their nature of knowledge carriers, and thanks to the high level of mobility of human resources inside the industrial districts, increase the opportunities to share and acquire knowledge. In supporting knowledge creation it also becomes relevant the firms’ organisational structure and their informal interrelationships, which improve the information flows and the promptness in solving problems. These factors allow to identify the industrial district as a local context of innovation since knowledge is continuously created in numerous areas. In particular, this “multi-centred base of knowledge creation” (Camuffo & Grandinetti, 2011, p. 43) allows to guarantee adequate conditions at the basis of the knowledge transfer process examined in the previous

paragraph, that in its turn it serves as the catalyst for creating knowledge by *combination*. In fact, the three mechanisms of knowledge transfer, on one hand, can lead to a mere *knowledge replication* if this knowledge is absorbed without modifications, on the other hand, these mechanisms can bring to the *creation of new knowledge* when the transferred knowledge is combined with another one.

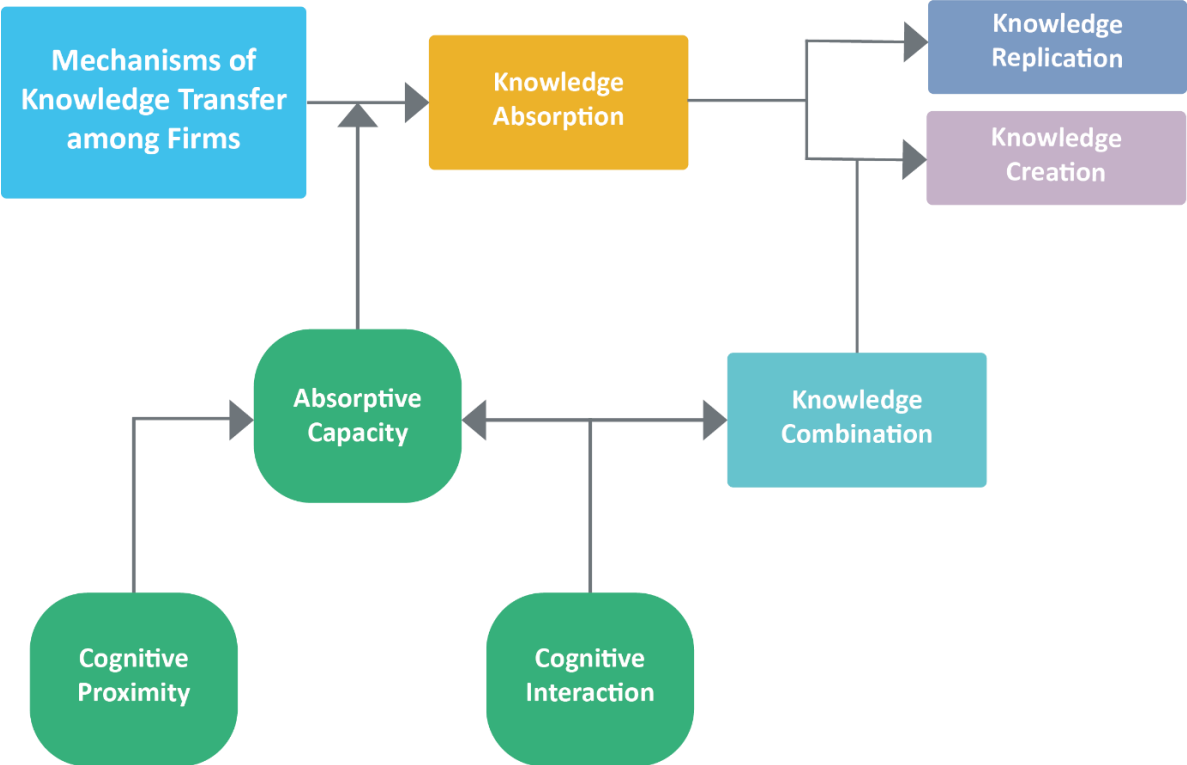
From the knowledge-based perspective, Camuffo and Grandinetti (2011) underline that the combination of knowledge is a key element both in the generation of new knowledge, but also “in the mechanisms of knowledge adjustment in relation to the context of transfer” (p. 43). In particular, the two authors stress the role of the combination in involving both tacit and explicit knowledge which generate three typologies of combination: *tacit to tacit*, *explicit to tacit* and *explicit to explicit*. In other words, Camuffo and Grandinetti amplify the concept of combination developed by Nonaka (1994), which is only focused on the generation of new explicit knowledge through the combination with the available codified knowledge. Consequently, both the combination as well as the transfer of knowledge become essential elements in the innovation process, emphasising the nature of industrial districts classified as local innovation systems with a high level of knowledge creation. It is relevant to highlight the imitative behaviour towards a new product, introduced into the market by a competing firm, comprises only a dimension of the complex process to create new knowledge. In this regard, for instance, the emulating firm may own a typology of knowledge which can be used to introduce incremental innovations, and thus, improve the features of the imitated product. In other cases, the imitating firm may exploit its “complementary resources to innovate its core competencies” (Teece, 1986, p. 288), improving the production process or innovating its business approaches through some typologies of technical devices. Consequently, it is possible to speak of *innovative imitation*, because the imitating district firm activates a combination of the cognitive input that it gains (for example, through the analysis of the behaviour of the innovating firm or the new artefacts placed on the marketplace) with its specific knowledge heritage, which has to be partly different. The innovative imitation, a very widespread phenomenon inside the industrial districts, is especially favoured by the firms’ interrelations, the reinforcement of existing partnerships and the development of new collaborative arrangements both inside and outside the district’s boundaries, which represent an efficient driver for the creation of new knowledge and innovation. The correlation between imitation and innovation, for instance, characterised the beginning

of the “plastic revolution” in the sportssystem district of Asolo and Montebelluna. In fact, the first modern plastic ski boot was produced in the United States by Robert (Bob) Lange in 1966. However, the Italian firm of winter sports products, Nordica, was the first district firm in Montebelluna to rely on the new technology of production, so that Nordica was able to change the original method with a more efficient and innovative process of production. The innovation realised by Nordica was later imitated by several leading firms inside the sportssystem district. Concerning the approaches displayed by the small local manufacturers, the change in the process of growth of the district encouraged them to convert to specialised activities in the new chain of production, or to focused on finished sports articles, such as après-ski and many other typologies of sports footwear. The example just described is particularly interesting since it suggests that the introduction of radical innovations give the opportunities to revitalise the industrial district. The use of plastic in the process of production brought to the creation of new channels of supply, a radical conversion of production technologies, and a renovation of the technical skills and competencies required to support the new processes of production above described. The production of new knowledge can also be activated by the mobility of human resources among firms. In particular, since individuals can be considered as knowledge carriers, they can create new combinations of knowledge where they move, if they are able to adapt to the new contexts (similar but not equal in terms of knowledge backgrounds) and communicate efficiently with the potential receivers of their knowledge. In this regard, there seems to be a “correlation among knowledge transfer and the generation of new knowledge by combination” (Camuffo & Grandinetti, 2011, p. 44). In fact, leader firms usually involve expert subcontractors to obtain detailed and useful data since they are directly involved in market activities. Or, for example, these firms may involve other specific companies, not necessarily inside the local context, in the supply of specific technologies or services to create new products. The correlation above underlined is verifiable, for instance, through the partnership between Luxottica and Facebook to release augmented-reality Ray-Ban glasses (codenamed Orion), in order to replace phones and tablets. This innovative product, that will be marketable between 2023 and 2025 (La Stampa, 2019), combines design and high tech, tradition and innovation, style and functionality, and mainly different product competencies, from technological to manufacturing knowledge, and allows both Luxottica as well Facebook to enter in a non-mature but developing market. In particular, Microsoft recently declaring

the intention to follow the same strategic approach has forced Luxottica and Facebook to intensify the sharing of knowledge through the increase of inter-exchange of human resources and the use of specific production machinery in order to reduce the product's release time. This has led many firms of the Belluno eyewear district to collaborate with Luxottica especially in relation to the transfer and combination of different manufacturing competencies to create a product which is able to balance craftsmanship and technology. From a general point of view, the Belluno industrial district is continuously moving towards new frontiers of innovation of products and process. This is particularly visible in the use of innovative materials as titanium, carbon fibre and epoxy resin (Optyl) for glasses' frames, and the exploitation of 3D printing in order to reduce the time of eyewear's production process. In particular, the technological progress in these last years has forced many actors inside the district to create the right conditions to expand the range of consumers, focusing both in the eyewear care and the eyewear design. In this regard, the research and development team of Luxottica have created important innovations in sun lenses and frames: for instance, the firm in collaboration with Essilor made the courageous move to integrate aerospace material into Ray-Ban frames in order to make them more indestructible and also lighter on the face. Luxottica, moreover, focusing on the eye protection, created the Oakley's Plutonite, a shatterproof and lightweight lens material that can resist at the impact of a baseball thrown at 160km/h. Furthermore, the collaborations and the transfers of knowledge among actors inside this industrial district, have brought important local institutions as Certottica to collaborate with the members of "ITS Academy in Design e Tecnica dell'Occhiale" with a project called "APollO" in the creation of a glasses prototype that gives a full protection from pollen. The importance that the flows of knowledge have inside the Belluno industrial district are also visible in the exploitation of competencies with external institutions as the University of Padua, mainly in relation to the creation of a degree in optics and optometry focused on the formation of professional figures responsible in the development of innovative products for optical sector in line with 4.0 industry dimension. Therefore, through these examples it is mainly underlined how the transfer and the combination of knowledge have a tendency to integrate towards a common objective based on the renovation of the industrial district, mainly in the case in which the firms' entrepreneurial spirits are focused on innovations that guarantee the development of the Belluno industrial district.

Figure 10 combines the model outlined in Figure 9, including the elements analysed in these last paragraphs. In particular, it is underlined the relevance of the cognitive interaction when the knowledge combination process is generated by the relations developed by district firms and human resources, determining factors for the creation of new knowledge and the elements from which it is possible to mark the industrial district as a local system of innovation.

Figure 10: The transfer and combination of knowledge inside industrial districts



Source: Camuffo & Grandinetti, 2011, p. 45

3.5) Cognitive permeability to the external environment

In an economic context characterised by global scale competition in which the key factor to survive is innovation, the capacity to absorb and combine different competencies from external sources in terms of products, processes of production, patents and the need to update rules, certifications, scientific and technical knowledge, have become the

prerequisites to guarantee the origin of the district firms, or in some cases the factors at the basis of its evolution. Consequently, these conditions bring the industrial districts to acquire a cognitive permeability to the external environment through several methods and approaches. In particular through: the formation of new firms by involving both local and external entrepreneurial resources, the relationships between district firms and commercial customers downstream of the supply chain, and with external sources upstream of the supply chain which provide technologies, services and raw materials; the exploitation of the professional experiences acquired outside the district firm by individuals; the imitative behaviours towards the innovations introduced by the external competitive players; the involvement of local institutions as intermediaries to create connections between district firms and external environment; and the employment of human resources outside the industrial district to gain new knowledge or knowledge that is not available at the local level. All these cases illustrated represent the different forms of knowledge transfer discussed in the previous sections.

The acquisition of external knowledge is, thus, an essential condition in both the origin as well as the evolution of the industrial districts. In Brenta, the establishment of the Luigi Voltan footwear firm represented the basis for the origins of the Riviera del Brenta footwear district in 1898, in which many small craft workshops were already established and operating. Voltan, after spending some time in Boston working in all the principal departments of one of the most advanced shoe industry in the world, he acquired the necessary know-how to switch from manual to mechanical shoe production, a mechanism of production totally unknown to the Italian craftsmen (Voltan, 2020). For this reason, after coming back to Italy from the United States, He founded a firm with an innovative commercial and productive formula, mainly based on the mechanisation of some phases of the productive cycle, that allowed him to cut costs and consequently to lower the price for consumers. This enabled Voltan footwear firm to become one of the leading Italian firms in the shoe sector, and the introduction of the *serialised production process* was a turning point for the local productive area of Brenta, since this model of production was quickly applied by the other local firms. Furthermore, this firm played a key role in the transformation of the local craft area into an industrial district, because between the 1920s and the 1930s many employees of Voltan firm decided to become entrepreneurs, and in several cases operating as subcontractors of the leading firm. This example underlines not only the acquisition of external knowledge, but also emphasizes the role of

intra-district flows of knowledge at the basis of the development of an industrial district. An additional example of knowledge acquisition from the external district environment is given by Luxottica, the leading firm in the eyewear sector. In particular, the process of internationalisation, which began in the 1980s, allowed the firm to build a strong worldwide commercial network. In this regard, the acquisition of Sunglass Hut in 2001, one of the main global destinations for the most fashionable high-quality and performance sunglasses brands, allowed the Italian firm to integrate its distinctive productive and distribution competencies with those of direct marketing, and consequently develop specific strategic approaches and knowledge mainly in terms of customers' needs and after-sales assistance.

Another typology of cognitive permeability is represented by the interrelations among the large multinational corporation and industrial districts, mainly attracted by their intangible assets. In particular, the investments within the local productive contexts, the purchases of district firms, or the creation of many relationships are principally related to the recognition of specific skills, knowledge, and capability that may be useful to obtain competitive advantages in the reference sectors of these multinational companies. In this regard, they created new strategic networks in which the flows of knowledge between the local and external context of the district improved the opportunities of knowledge combination among the parts, and allowed the industrial district to open towards an international context (Palmi, 2014, p. 125).

There are several examples of multinational corporations inside the Italian industrial districts as the LVMH Group and Essilor inside the Belluno industrial district; the Swedish multinational home appliance manufacturer Electrolux, which produces washing machines and refrigerators in the industrial district of Pordenone; the American multinational corporation Nike inside the sportsystem district of Montebelluna and Asolo, which operates through a laboratory dedicated to design and production of football shoes (Guolo, 2019); or the Italian Tetra Pak Packaging Solutions Spa which has favoured the growth of the "Packaging Valley" in Emilia.

The evolution of the industrial districts along a knowledge trajectory can also involve the international development of actors operating inside these local productive areas. In particular, the increasing globalisation of economic processes has changed the competitive scenario of many district firms, and has brought them to have a higher level

of cognitive permeability to the external environment characterised by an international dimension.

From the cognitive perspective, Camuffo and Grandinetti (2011) identify the district actors which operate within a global economic context as global district firms: that is, firms of medium to large size, which absorb, combine and share knowledge at the international level to create new knowledge. Consequently, their value chains and local relationships are combined with international socio-economic environments through the creation of global networks. These, for instance, can be established through the delocalisation of some phases of the production process, the domain in specific distribution channels through the acquisition of retail chains, the creation of joint-ventures, the relationships with determined extra-district actors which provide quality control services or that are focused in developing innovative technologies. This path of analysis underlines, in particular, how the global district firms' channels in which knowledge flows are not only based on the cognitive proximity which regulates the knowledge transfer among local district firms, since the global district firms have to develop specific capabilities of knowledge codification which originates from the external environment and create adequate access conditions to a universal language.

The codification of knowledge represents a key factor in the process of creation of the global district firms. In fact, this cognitive mechanism plays both a relevant role in the processes of innovation, as well as allowing to increase the capability of firms to create solid networks of relationships in a global panorama and improve their investment's capacity on their own tangible and intangible resources. However, both tacit knowledge as well as its development through the processes of learning by doing do not become less important factors.

The global district firms have to preserve their capabilities to produce tacit knowledge and integrate them to the processes of knowledge absorption and combination from both local and external district contexts. Consequently, the wide pool of knowledge with which these firms interface allows them to create radical innovations of product and process.

These typologies of innovations are more complex if compared to the incremental ones since they require the complete mastery of information and communication technologies, the absorption of complex codified knowledge and their recodification on the basis of the sector or industry of reference. Furthermore, this combination often implies the integration of the absorbed codified knowledge and the firm's tacit knowledge. The result

is the introduction of radical innovations inside the industrial district whose knowledge is hardly absorbable by the other district firms due to their “limited” stock of knowledge. For this reason, the acquisition of knowledge through imitative behaviours, the intra-district relationships and the mobility of specialised human resources in relation to the global district firms might reduce the capacity of growth of the other district firms or weaken potential spin-off mechanisms of new firms. From this perspective of analysis, the development of global district firms, on one hand, might favour the openness of industrial districts toward extra-district contexts in which it is possible to acquire new knowledge, on the other hand, the concentration of specific assets within the organisational structure of these firms might limit the knowledge transfer in the local context and, hence, negatively affect the growth of industrial districts.

A relevant example of a global district firm is given by Luxottica, whose path of growth, mainly based on the vertical integration and processes of internationalisation of the first part of the 80s, has gradually contracted the relationships with the Belluno eyewear district to few local firms. In particular, the acquisitions of Ray-Ban and Oakley, two of the most important brands in the sunglasses market, brought Luxottica to delocalise part of the production from Italy to America and China, amplifying its knowledge in terms of customers’ needs and technical and technological competencies. This effect has then led Luxottica to focus since the 2000s in the acquisition of numerous strategic luxury brands and in the creation of agreements with important international actors, improving the capacity of gaining codified knowledge which Luxottica has integrated with its stock of knowledge. This strategic approach has guaranteed the development of its human resources’ skills, the exploitation of innovative machinery of production and the creation of radical innovations of product, mainly in relation to the widening of the range of eyewear models. Consequently, it is relevant to underline that Luxottica is an interesting case of global district firm, since it has not only been able to combine the skills inherited within the Belluno industrial district with the pool of knowledge gained from the extra-district environment, but also to rapidly exploit the opportunities deriving from the entry into a global cognitive network, and obtain strategic resources in order to acquire competitive advantage over rivals.

The studies and examinations of the economic literature concerning the cognitive permeability to the external environment underline, moreover, the role of the small and medium-sized firms operating in the final market. In this regard, it is important to

highlight that their strategic approaches, mainly based on the combination of extra-district's growth and a focus strategy on niche-markets, do not lead to the deterioration of relationships with the industrial district in which they operate, as opposed to the global district firms' competitive strategies.

The small and medium firms, downward of the supply chain, carry out a product differentiation focused on the global niche-markets or specific customers' needs, which requires a high level of quality and innovations, as well as the capacity to rapidly adapt to the variations of market's circumstances. Consequently, the role played by the industrial district in their strategic perspectives is a determining factor, since it offers a pool of knowledge, technical capabilities, high skilled human resources, and the possibilities to create collaborative relationships with other specialists of the industry that, due to the organisational structure of these firms, are difficult factors to find outside the district of reference. For these reasons, despite the international projection of these firms, the net of interrelations created with the industrial districts guarantees the availability of key resources for their entrepreneurial growth.

Lastly, a significant role in supporting the industrial district's growth is played by local institutions. In this regard, as it is underlined in the Second Chapter, the choices which these actors put in place have to simultaneously sustain both the internationalisation and the innovation processes of district firms, as well as the development of local relationships: that is, factors at the basis of the interpretation of the industrial district as a local innovation system. These public or private subjects, which operate as knowledge-intensive business services (KIBS), improve the absorptive capacity of district firms as regards external knowledge. In fact, the services they offer incorporate and combine knowledge obtained from both local as well as external district subjects in order to provide ever more up-to-date services (Savi, 2020). In particular, since KIBS are in close contact with the district firms, they get several information about their method of operation in the market, the innovation processes they develop, and their needs in terms of knowledge and human resources. Moreover, thanks to the relationships created with the economic actors located in other countries or regions, they can provide specific services to improve, for instance, the product and innovation processes, the quality of products, the technological transfers, and the business and marketing systems of district firms, through the creation of networks among the local cognitive context of the industrial district and that existing outside the district's boundaries.

In the Italian context, many KIBS were born in the regions of the industrial district of reference. This way, there is an improvement in the rapidity and the efficiency of the services tailored to the district firms' necessities. Among the most relevant examples, in addition to Certottica, the *Politecnico Internazionale dell'Occhiale* and ANFAO, inside the Belluno eyewear district particularly important is the role played by the Eyewear Museum in Pieve di Cadore, one the most important museums in the world. It was opened in 1990, and currently it is managed by the *Fondazione Museo dell' Occhiale Onlus*. In detail, it was born to preserve the remains of the craft and industry which characterised the primary wealth of the Belluno area. In addition to representing the historical and cultural heritage of the eyewear production, and the "container" of artisan competencies expressed through more than 3000 eyewear models and components, this museum organises in collaboration with ANFAO and Certottica several educational courses for the local schools, as learning services tailored for the district firms, and therefore supporting the local firms, especially in these last years, in rediscovering the "essentiality" which characterised the eyewear models at the origin of the Belluno district.

In conclusion, it is clear how the industrial districts work as relatively impermeable cognitive systems, in which the transfer of knowledge and its generation take place efficiently and effectively, both in terms of intra-district as well as extra-districts flows of knowledge. Therefore, these features allow to define the industrial districts as valuable examples of local innovation systems.

The role played by local institutions, mainly in relation to the international trajectories of district firms, is essential in guaranteeing specific services focused on facilitating the absorption of external district knowledge and its combination with the stock of knowledge owned by local firms.

3.6) The Coronavirus's effects in the reconfiguration of the global value chains

Since the 1990s, the vertical fragmentation of industries and the markets' global integration have increased notably, producing powerful consequences on the division of labour inside firms and their performances and behaviours in both developing as well as advanced countries (Amador & Di Mauro, 2015). In this regard, the industrial districts,

especially the Italian ones, have proven to be able to evolve within the global value chains, efficiently exploiting the knowledge regeneration processes through the acquisition of external knowledge and its combination with the local stock of knowledge. This capacity of development derives from both the heterogeneity demonstrated by many local small and medium-sized firms in terms of performances outside the district's boundaries, and also by "the dominance of global district firms inside the global value chains of reference" (De Marchi, Gereffi, & Grandinetti, 2017, p. 41). In particular, taking as reference the global value chain theoretical frameworks (Gereffi, 1994; Henderson, Dicken, Hess, Coe, & Yeung, 2002; Gereffi, Humphrey, Sturgeon, & Timothy, 2005), the global market engagement has been redefined from being a passive process which includes the reaction to market signals by only independent economic actors, to a set of industrial renovations built inside system-wide dynamics of control and coordination by both economic as well as non-economic actors, and in which the industrial districts represent crucial elements in the processes of development of the global value chains' mechanisms. In this regard, both the endogenous and, mainly, exogenous factors which can affect these mechanisms can lead to irremediable consequences inside the economic systems at the basis of the global value chains. This perspective of analysis allows to understand how the Coronavirus, compared to other crises that originated inside specific parts of the global economic system (the burst of the dot-com bubble in 2000 or the Lehman Brothers collapse in 2008), is an exogenous factor. Consequently, the economic impact is strictly correlated to the duration and evolution of the emergency caused by the Covid-19, both in the national as well as in the international territory. However, it is clear that, in the long run, it can create severe economic and financial effects on all the global economic systems, bringing to a radical reconfiguration of the firms' strategic approaches towards the value chains of reference.

From the beginning of the pandemic, almost 13 million people have been diagnosed over the world, while more than 550 thousand people have died (The New York Times, 2020). Although this human toll is indubitably the most tragic cost of the Coronavirus, it is relevant to underline that the economic costs to challenge this epidemic are drawing the attention of the global companies, investors and policymakers. In fact, besides the health risk, the Covid-19 might be the Black Swan of our generation, since it has strongly damaged the economic, financial and political contexts of countries all over the world,

morphing itself into a significant shock within the global value chains, that are the symbols and the key instrument of the global economic and industrial integration.

From the value chain perspective, although many studies and examinations have associated the economic and financial crisis brought by Coronavirus with the episodes of financial disruptions caused by the SARS epidemic in 2002 and 2003, it is clear how this association is relatively unrealistic, since the importance of China in the global economic environment has grown enormously in the last 18 years. In fact, compared to the years of SARS epidemic, nowadays China is much more integrated with the worldwide economy, as it has grown from 9% of global manufacturing output in 2003 to more than 28% at the beginning of 2020, and more than doubling its share of trade (Betti & Kristian, 2020). Moreover, during the year in which SARS epidemic began, the GDP of China covered 4,31% of the total world GDP. On the other hand, at the time of the diffusion of the Covid-19, it represented about 16% of the world GDP in the first part of 2020.

The importance of China in the global economy does not concern only its status as an exporter and manufacturer of consumer products. In fact, China has gradually become the primary supplier of intermediate inputs for foreign manufacturing firms, especially for Europe and America. For these reasons, the lockdown of manufacturing in China because of the Coronavirus disease has disrupted the global trade, and it could generate an enormous decrease in exports across global value chains at the end of 2020 (UNCTAD, 2020). In particular, according to the UNCTAD estimates concerning the first quarter of 2020, among the most damaged economies in terms of trade impact due to the Coronavirus' effects on the Chinese economy have been identified the European Union (€14.6 billion), the United States (€5.4 billion) and Japan (€4.9 billion), mainly regarding the automotive, machinery, precision instruments and communication equipment sectors. In this regard, it is clear how the global effects on the value chains' reconfigurations have resulted mainly from the alarming situation in China.

From a general perspective of analysis, the impact of Coronavirus on the global value chains has forced companies to rethink the supply chains' configuration. In fact, only the topology of these chains - their patterns, connections and shape - will determine how the global economy is able to respond to the widespread supply and demand shocks generated by the Coronavirus. The obvious consequence is that the Covid-19 has put into sharp focus the threat of relying heavily or completely on factories which are localised in single countries.

The lockdown of many industrial sectors in China, like the automotive, electronic, textile and biomedical, has created significant interruptions on the supply chains of many European countries, especially in Italy, which had already started diversifying their supply chains out of this East Asian Country (Tan, 2020).

Italy, in particular, has been negatively affected by the economic and health crisis deriving from the pandemic: according to the estimates provided by Confindustria, the Italian GDP will drop between 8% and 10% at the end of 2020. Moreover, it is important to underline that, if compared to the global financial crisis in 2009 that generated a drop of the Italian GDP by around 5,5% leading Italy to lose productive capacity, the Coronavirus's effects could have harder negative consequences. However, it is estimated a slight rebound by 2,3% in the Italian GDP. Undoubtedly, this "optimistic" forecast is based on the hypothesis that approximately 100% of the firms will restart their production activities by the end of August 2020 (Picchio, 2020).

The Coronavirus has hit several sectors in an asymmetric way. For instance, the education, financial, banking sectors have not been affected by the crisis: in fact, these have been able to reorganise their activities through the digital platforms, avoiding the risk of unemployment. On the other hand, the pharmaceutical, biomedical and chemical manufacturing industry, as well as the telecoms sector and food and beverage industry have shown an increase of demand, which has gradually led to an increased rigidity of supply. It is relevant to underline, instead, the serious effects on the manufacturing, automotive, tourism and restoration sectors, which have been deeply hit by the lockdown of activities all over the world. In this regard, Italy has been one of the main countries to be strongly affected in the above-mentioned sectors, especially in the manufacturing segment.

Many countries, because of the strong interdependence between the value chains of their firms, have highly suffered the lockdown of their production processes mainly because of the lack of essential components and materials at the basis of their production cycles. An interesting example is given by the current shortage of paracetamol in the pharmacies inside the Eurozone since Europe imports around 80% of the active pharmaceutical ingredients from China (Lionel, 2020). These consequences, in fact, underline the necessity to modify the value chains in order to increase production and distribution capacity. In this regard, it is reasonable to speculate a drastic modification of the value chains through the adoption of specific measures to guarantee higher transparency on

multitier supply chains, both defining the origin of the supply chains as well as identifying different potential suppliers to rely on. This approach, in fact, could bring manufacturers to create specific joint agreements with many different suppliers favouring the *supply chain diversification*, based on the constant monitoring of the inventory levels and lead times, and supported by an early-warning system for potential supply disruptions. This manoeuvre, clearly, has to be combined with a solid recovery plan that takes into account the available inventory along the value chain and the enlargement of the warehouse capacity to understand the operational and financial consequences of a protracted shutdown. Once the most critical parts inside the supply chains are understood and upgraded, a rapid restart after a crisis will be more plausible.

In order to better match supply chain and production planning with the expected demand, especially in critical conditions as those created by the Covid-19, it is possible to speculate the creation of many production chains among adjacent countries to optimise the lines of production, with consequently shorter, but more efficiently coordinated value chains, if compared to the globalised ones. Taking into consideration the Eurozone, it will be necessary to create value chains on the European level, instead of on the international one, with particular attention towards some sectors, such as robotic and automation, that will guarantee greater opportunities of innovation to solve crises similar to the one created by Covid-19. It cannot be excluded that the industrial districts could become central referring points from which it is possible to create models of economic recovery, thanks to their capacity to operate efficiently and create innovation at the local level. From this perspective of analysis, it emerges that the most relevant effects of the Coronavirus will not only be on the macro-economic level but especially on the micro-level. In this regard, it is reasonable to talk about a reconfiguration of the value chains in terms of fortification of logistic capacity. In particular, in a time of crisis, the identification of existing and future logistics capacity is indispensable, especially in terms of required capacity and sensitivity of time-horizon for the goods delivery. Consequently, both the tracking of on-time status of products transit, as well as the monitoring of relevant variations within the transport systems, such as border closings and airport or train congestions for the freight transport will be fundamental. In other words, keeping a dynamic approach to the management of logistic issues will be decisive in quickly adapting to any environmental changes or critical situations.

The crisis caused by the Coronavirus, moreover, will lead to a drastic modification of the political and industrial measures in each Country. The pandemic, in fact, has highlighted the necessity to create adequate actions of economic recovery, whose efficiency is strictly related to the capacity of institutions of identifying the weak links within the value chains. In this regard, it is reasonable to speak about a change in the industrial policies for the protection of firms and self-employed workers, both in the short as well as in the long-term. Taking as reference the Italian context, in relation to the short term, the Italian government approved the *Restore Liquidity Decree* (Law Decree no. 23 of 2020) on 8th April 2020 that, in combination with the *Cure Italy Decree* (Law Decree no. 18 of 2020) of 17th March of the same year, it provides businesses affected by the Coronavirus emergency a package of financial assistance planned to help Italian companies survive the dramatic short-run consequences of the Covid-19. In this regard, an important measure is the *SACE Guarantee Scheme*, an emergency plan that, thanks to the Italian's state lender *Cassa Depositi e Prestiti* and its export credit agency *SACE*, will provide an amount of €200 billion of loan guarantees until 31st December 2020 to any type of enterprise that satisfies specific requirements, in order to mitigate the effects of the lockdown on economic activities and guarantee a rapid recovery (Canino, et al., 2020). Regarding the long-term, it will be fundamental the creation of specific political measures to sustain the recovery of competitiveness of those countries strongly affected by the Coronavirus emergency. In this point of view, on 23rd April 2020 the European Union leaders have decided to formulate a *Recovery Fund* to support its 27 Member States, including Italy, in order to rescue their economies. Successively, on 27th May 2020, to assure that the recovery is sustainable, fair and inclusive for all the EU Member States, the European Commission proposed the creation of a recovery plan from 2021 to 2027 that is composed by two important components. The first one is called *Next Generation EU* and it is an instrument that will increase money through a temporary lifting of the European Commission's resources ceiling to 2% of the European Gross National Income. This manoeuvre, in fact, will enable the European Commission to exploit its strong credit rating in order to borrow €750 billion within the financial markets (€250 billion in loans and €500 billion in grants). This instrument will be fixed inside a renovated *Multiannual Financial Framework* (MFF) that, together with the *Next Generation EU* funds, would comprise €1.1 trillion of spending in the course of the seven years (Cameron, 2020).

In conclusion, even though it is necessary a great effort in order to respond to the health emergency and economic contraction, it is essential to underline that the severe effects caused by the Coronavirus have created precious opportunities to recodify all the development models, that until now had given the impression of being “unbreakable”.

In referring to the Italian case, some relevant crises as the Spanish flu (also called the 1918 flu pandemic) or the Second War-World (1939-1945) have brought critical consequences on the economic, financial and social situation of Italy. However, the Country has demonstrated a strong capacity of recovering, mainly in the post-war years thanks to a *reconstruction* of its socio-economic and financial mechanisms that led Italy to have in 1950s important growth rates of its GDP (around 7% in the years of the Italian reconstruction). The necessity to restart the economic activities, combined with the moral strength shown by the Italian people to challenge one of the worst periods of the historical growth of Italy, have underlined how most of the time serious difficulties can become opportunities to improve and innovate. In this perspective of analysis, it becomes essential the creation of strategies coordinated at the global level to solve crucial humanitarian crises like global warming, armed conflicts, natural disasters, famine, and other critical emergencies. In fact, only in this way it will be possible to efficiently manage potential future crises, both in the economic as well as in the health context. For this reason, a better management of the globalisation process is fundamental, overcoming the model of sovereign behaviour that has developed in the last years, focusing the attention in the management and organisation of the flows of knowledge and information to rapidly solve future crises, both health as well as economic. In fact, because of the lack of important investments on the World Health Organisation (WHO), this agency of the United Nations has not been able to manage the pandemic, mainly because of an inadequacy of information in terms of models of behaviour to follow on the basis of the measures adopted by China to counter the crisis caused by the Coronavirus. Lastly, it is fundamental in invest on resources that allow consolidating and innovating the facilities at the basis of each Country, mainly those related to health, automation, education, and labour sectors. In particular, concerning these aspects, it will be essential to find alternative options to guarantee the operativity of these services, such as home medical assistance, learning activities organised through on-line platforms and smart working. Maybe, if these actions had been taken preventively, the dangerous effects caused by the Coronavirus could have been anticipated and mitigated.

CHAPTER 4

LUXOTTICA: THE IMPORTANCE OF KNOWLEDGE ASSETS

4.1) Introduction to the chapter

The aim of this Last Chapter is the analysis of how the vertical integration of Luxottica has played a key role in its development and in the improvement of its productive skills and competencies. In this regard, one of the main aspects of the vertical integration process is the capacity of the company performing it in order to manage the quality of each stage of its supply chain: in fact, a vertically integrated business model allows to keep control of all the firm's characteristics, from the development of the product to the final retail to customers. This, in turn, by creating a 360 degrees perspective of its business and, consequently, of its relationships with customers, makes the firm aware of all its strong points. Moreover, from the knowledge-based viewpoint, Luxottica's international growth has allowed to create favourable conditions to rapidly and dynamically respond to the changes in the eyewear market, and hence acquire the right capabilities to create an accessory that is functional but at the same time in line with the fashion trends and extremely diversified.

As it will be explained in this chapter, Luxottica is able to produce about 1800 eyewear models each year through an accurate process of production, that is extremely based on the control of every stage of production in which the eyewear takes form, and the exploitation of highly specialised competencies in making the best eyewear models.

Concerning the vertical integration of the value chain operated by Luxottica, in this paragraph we will deal with the process of delocalisation started in 1997 in China: a strategic approach that has improved Luxottica's productive capacity and favoured the acquisition of specific competencies that have further increased the pool of knowledge of the Italian firm.

Lastly, at the end of the chapter, we will address the current economic crisis caused by Covid-19, and its effects on Luxottica's value chain.

4.2) Advantages and disadvantages of vertical integration

Vertical integration is considered as one of the best-known entrepreneurial strategies and it has been largely used among companies, particularly in the last century. The firm, with this strategic approach, carries out inside its structure the activities required to produce and/or distribute its artefact, exploiting only a small part of the support of third-party economic agents existing on the market of reference.

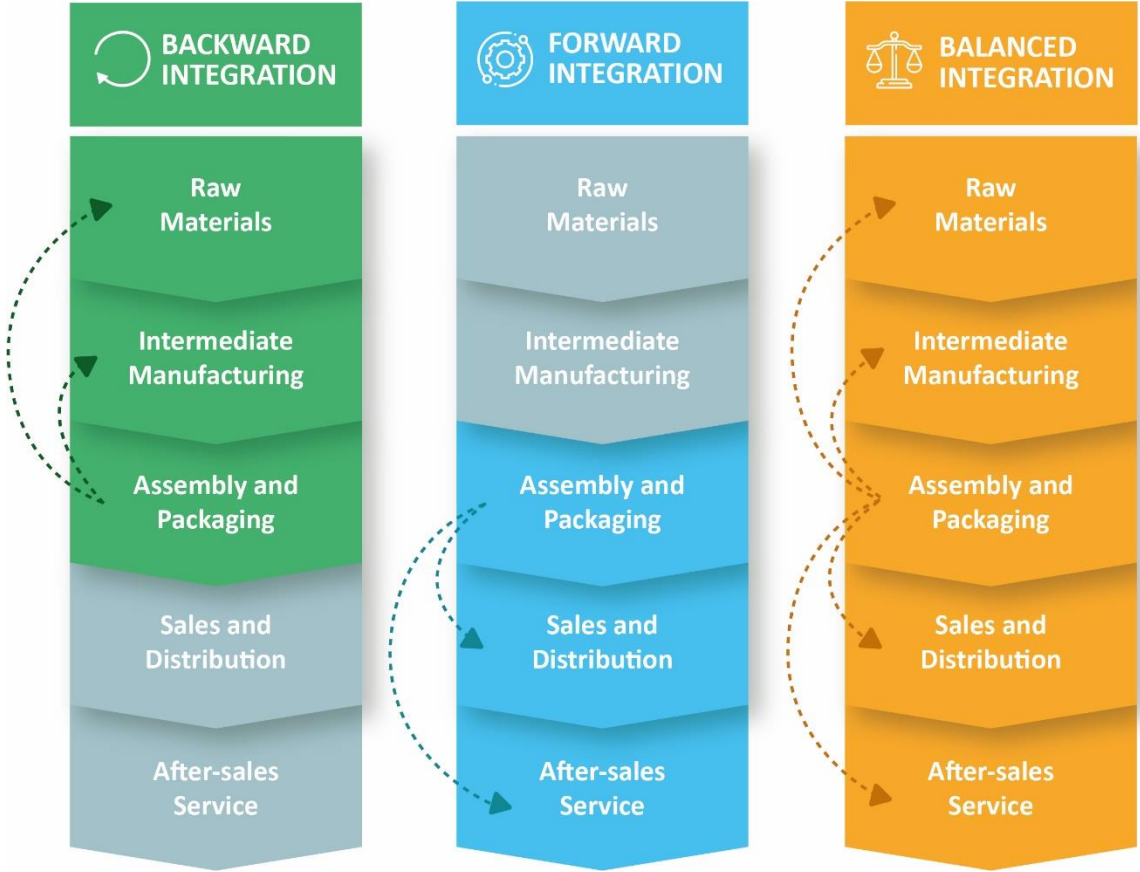
From the theoretical perspective, the numerous definitions of the vertical integration process share a common element: the expansion of the firm's business in different areas that are at different points in the same production path. In particular, according to the definition given by Perry (1989), vertical integration is generally interpreted as "the process of eliminating market or contractual exchanges and substituting them with internal exchanges at the firm's borders". Therefore, as opposed to horizontal integration in which a firm grows by acquiring or merging with a similar or a competitive firm in the same industry in order to increase the size of the business and the scale of operation, vertical integration has the purpose of making both the production as well as the distribution cycle stronger and smoother. In this regard, before analysing the motivations that bring companies to vertically integrate, it is essential to underline that there are three main typologies of vertical integration (Figure 11) that firms exploit to control multiple parts of their supply chain: *backward*, *forward* and *balanced* integration.

The concept of backward (*upstream*) integration concerns the capacity of a firm to expand backward on the production path into manufacturing. In other words, a retailer acquires the manufacturer of its product. An interesting case of backward integration is given by Amazon.com Inc., that from an online book seller has grown into a book publisher. Moreover, Amazon owns parts of its distribution channel and warehouses worldwide. Instead, forward (*downstream*) integration is a strategic approach that firms use to expand by purchasing and controlling the supply of a product or its direct distribution. In particular, downstream integration supports firms removing the middlemen, namely the distributors, who would be paid to sell the firm's products, hence reducing their overall profitability. A clear example of downstream integration would be a clothing manufacturer opening up its own boutiques to sell its product.

Lastly, balanced (*complete*) integration combines the two types of vertical integration described above. In detail, complete integration occurs when the entire output of a

backward process is exploited wholly as an intermediate input for a forward process, or when the entire amount of intermediate inputs in a forward process is gained from the output of an upstream process. In other words, it allows to manage all the elements of the supply chain, from raw materials to after-sales service. This is the typology of vertical integration adopted by Luxottica for its value chain.

Figure 11: The three typologies of vertical integration



Source: Personal elaboration based on the definition of the three typologies of vertical integration

Based on the explanation of vertical integration, the question is why do companies adopt production structures that are vertically integrated? This strategic process can be justified because of seven key benefits.

The first one is the *reduction of transaction costs*. According to Williamson (1971), one of the pioneers of the *Transaction Cost Theory*, different phases of production are vertically internalised inside a firm when the transaction costs in stipulating agreements based on idiosyncratic, long-term relationships, outweigh the probable benefits of such

relationships. In other words, vertical integration can be considered as a possible alternative to market mechanisms to complete the transactions that the firm needs, when there is a potential transactional failure of the market in operations for intermediate goods, and also to lower the transaction costs that arise when using those mechanisms. These complications mainly arise in relation to the investments in human as well as physical capital outside the firm's boundaries.

A second motivation is the *protection of investments* and their better management. In modern economies, businesses exploit extremely specialised tools to train their dealers in using and understating this instrument, with the aim of generating specific skills in the firm's workforce. In a vertically integrated company, the planning and management take into consideration the requirements of those who make the product, who supplies its components, and who trades it. All these actors controlled by the firm are able to identify the investments in specialised plants, the required production capacity, and the improvements the firm needs to raise the quality of its product and have lower production costs, hence favouring the creation of economies of scale.

Another reason is related to the *independence from external suppliers*, in terms of potential excessive costs and unpredictability. This encourages the firms' productivity by streamlining the process of gaining materials for its product, producing it and selling it. This way, firms that are vertically integrated are also more time-efficient thanks to shorter turnaround times. Furthermore, the independence from external suppliers allows the firm to be protected from supply disruptions: consequently, the production process is smoother and potentially immune from supply delays. This motivation is directly connected to the fourth reason behind vertical integration: *the control of costs in the value chain*. In fact, when a firm is vertically integrated, it is able to manage expenses more closely, since it directly controls the steps of the supply chain. For this reason, firms are able to decrease operational, transportation and distribution costs, and hence guarantee lower products' prices to customers.

The fifth reason is related to the *market's distortions due to monopolies*. In particular, the acquisition of the supplier and the maintenance of its production scale allow the firm to ensure the supplier has an appropriate behaviour in terms of costs and services in line with the firm's purposes. In fact, in a situation of monopoly, the supplier is provided with a certain contractual power towards the firm of reference, and in this case, it is able to apply a higher price than its marginal cost for its services, lowering the firm's profit.

The sixth reason is the creation of *barriers to entry*. In fact, taking into consideration only the firm's interest in carrying out the process of integration with one of its suppliers, removes an important source of supply for a downstream competitor, generating barriers to entry and increasing the firm's market control. Because of this problem, the rival would undoubtedly be dissuaded to enter into the market. The last motivation concerns the consideration of the *know-how as a key strategic resource*. To this regard, through the firm's vertical integration, it is avoided the risk of making public the firm knowledge to external competitors. Over the years, firms have understood the relevance of internal knowledge as a competitive advantage to be preserved, mainly in differentiating their offer and consequently efficiently responding to the increasing changes in demand. From this perspective of analysis, Although there seem to be several benefits in vertical integration, on the other hand, it is not always advisable to follow that strategic path, since there are some potential negative aspects to take into consideration. For this reason, it is relevant to address four main disadvantages of the vertical integration strategic approach. The first obvious one is the *upsurge in firm's costs*: in fact, if on one hand the size of the firm increases, on the other hand also the incurring costs rise. This circumstance is a direct consequence of both the absorption of new production processes inside the firm's supply chain, as well as the increase in costs concerning the maintenance of the coordination and profitability of activities to pursue the business objectives.

The second one is the possibility that the vertical integration can make firms *less resilient to market trends' changes*. In this regard, when firms are extremely vertically integrated often find it difficult to shift their production to other types of goods. Furthermore, vertically integrated firms are less inclined to switch to other suppliers or producers external to their supply chains, even if they may have lower exchange rates or operating costs, because of a *lock-in effect* (Hellmer, 2010).

The third disadvantage is the *difficulty to correctly manage the vertical integration*, because of the different types of agents or productive parts inside the firm's structure. This condition, moreover, could lead to a slowness in creating innovation, since the firm is less inclined to changes in the reference sector, as previously explained.

Lastly, the fourth disadvantage in adopting a vertically integrated business structure is related to the complications deriving from the *increase of the barriers to exit*.

When a firm acquires a relevant market power through significant investments in the organisation of its structure, political or contractual agreements with other companies in

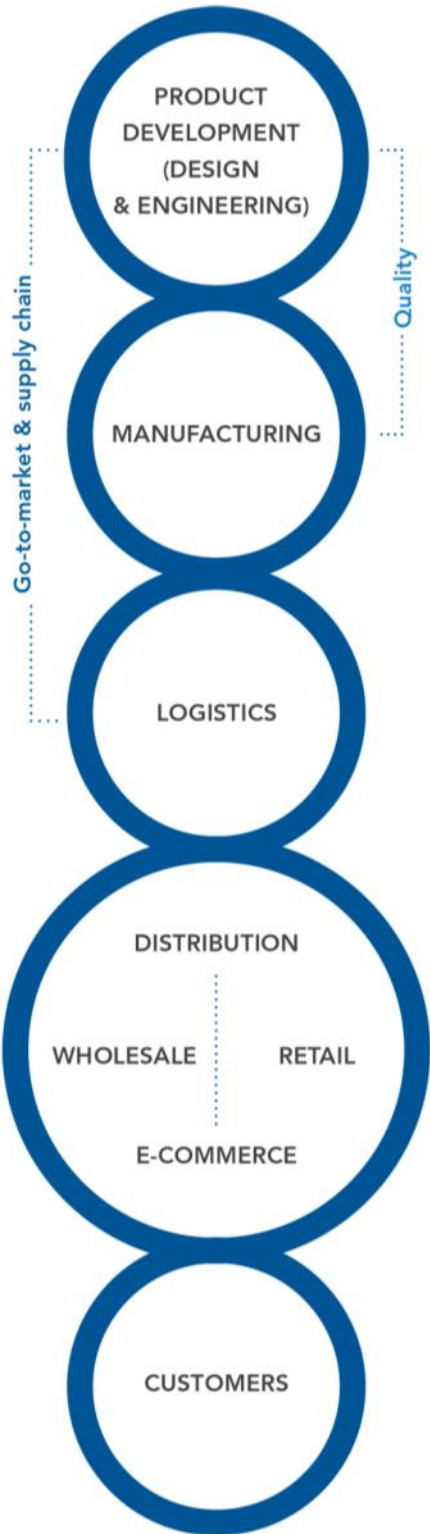
the same market, or in the absorption of specialised strategic suppliers, it is more difficult for a firm to exit from the market in which it operates. However, these four problems can be solved through a dynamic and flexible behaviour of the firm, that is not based on excessive internal bureaucracy and lack of collaboration among its business areas. In this regard, the adequate management of the vertical integration of the business structure gives firms the opportunity to grow exponentially acquiring the control of the market of reference, without affecting the mechanisms which regulate the functioning of the firm itself.

4.2.1) The vertical integration carried out by Luxottica

In the Second Chapter, we explained Luxottica's path of growth, characterised by an incomparable competitive capacity based on the increasing improvement of its market power. Among the factors which have contributed to the success of Luxottica inside the international eyewear market, a key role is played by the vertical integration of its value chain since the last part of the 1960s. This strategic approach, shown in Figure 12, has enabled Luxottica to develop an entrepreneurial attitude focused on integrating specific elements, such as production capability, improvement of competencies, skills and know-how, market's administration, attention to customer's needs and product quality, in order to have a complete management of the core conditions for its development.

Luxottica's current vertically integrated business model, both upstream and downstream, is the result of the visionary choice made by Leonardo Del Vecchio, who recognised the importance of producing internally complete frames. A strategic approach that was accompanied by the management of the eyewear distribution, initially in the wholesale segment, and later both in retail as well as e-commerce. In this regard, another relevant element which reinforced Luxottica's vertical integration was the entry into the manufacturing of lenses, mainly thanks to the merge with Essilor in 2019. From this perspective of analysis, it is possible to understand the reasons at the basis of Luxottica's vertically integrated business model through an important interview to Leonardo Del Vecchio, that is reported in *Del Vecchio e Luxottica. Come si Diventa Leader Mondiali* by Brunetti and Camuffo (2001).

Figure 12: The Luxottica’s vertical integration



Del Vecchio reports how the primary advantages pursued through the backward integration in the production were related to the opportunities of assuring high-quality eyewear and an efficient production processes, mainly through the exploitation of synergies among the business areas, introducing innovations, improving the product knowledge, lowering the firm’s costs, and reducing the manufacturing cycle time. At the end of the 1970s, the Italian firm acquired most of the eyewear components, that it successively assembled internally, causing several problems concerning the eyewear quality. The decision to gradually internalise the production process has not only created many opportunities to obtain innovations of process and product, but it has also allowed to improve the efficiency of the productive organisation through the development of the skills and technical competencies. These factors, in their turn, have increased the quality of the final product (Brunetti & Camuffo, 2001).

Source: Luxottica, 2019

For what concerns the forward integration in distribution, Leonardo Del Vecchio explains in the interview how the main purpose was to avoid the opportunism and uncertain behaviour shown by distributors. In fact, according to Del Vecchio, “the wholesaler is the brake of firms. The wholesaler trades your product if it is profitable for him, but he feels free to trade others [...] in the case in which you have an interesting good, the wholesaler collaborates well with you. But, if the next day he finds a product that is more suitable to sell, he will abandon you, making you lose that market” (Brunetti & Camuffo, 2001). Furthermore, if we take again into consideration Del Vecchio’s words in the interview, the control of distribution allows to better identify and analyse consumers’ tastes and trends: a strategic condition considered by Luxottica a key element in attracting the most prestigious fashion brands into its portfolio, and in creating ever more diversified eyewear models. The management of the forward integration allows to focus only on specific objectives, that guarantee the knowledge assets’ development of the firm. From this analysis, it is clear how the strategy of vertical integration adopted by Del Vecchio is deeply rooted in the entrepreneurial spirit of Luxottica, and it still represents a core element in the development of specific competencies and skills in the eyewear production, to the extent that it is possible to identify every eyewear produced by the Italian firm as *Made in Luxottica* (Luxottica, 2019). In every single pair of Luxottica glasses there is the combination of technical skills, capabilities, passion and commitment of individuals who work every day on creating the best eyewear possible, an object of extremely high quality and the result of ancient manufacturing traditions.

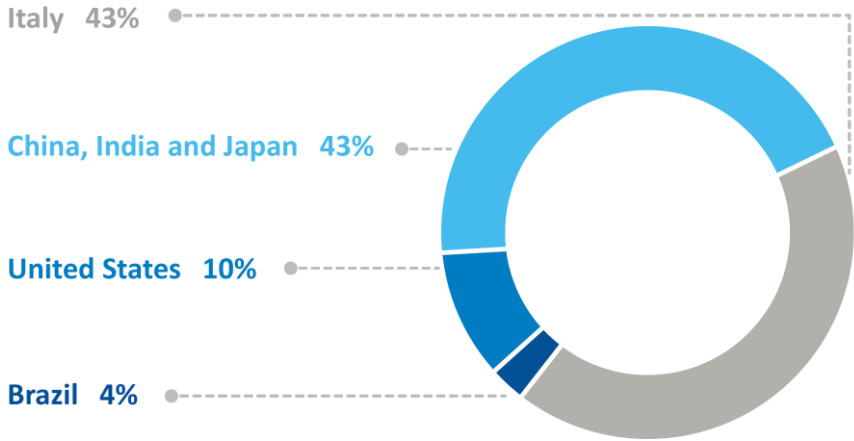
4.2.1.1) From design to finished product

The activities realised by Luxottica inside its value chain are characterised by a high coordination and organisation, allowing the firm to realise every year 1.800 eyewear models, that are the result of the vision and creativity of interior designers able to respond to the main tendencies and the consumers’ needs (Luxottica, 2019). The entire production process is carried out internally in each of the thirteen plants able to manufacture about 90 million of eyewear every year, starting from the realisation of the first style sketches, through the realisation of the prototypes, until the beginning of the mass production. Through the combination of craftsmanship and new technologies, such as the 3D

technology, very unique objects are created. These, successively, are tested, and the prototypes which meet the rigorous standards of quality, production time and cost are selected to be launched into the market. At each of these phases, the tool shop produces and prepares the instrument that will be required for the manufacture of the new eyewear models.

Luxottica’s manufacturing operations take place inside the numerous plants located in Italy, the United States, China, Japan, Brazil and India. In Italy, the manufacturing plants are located in Agordo, Sedico and Cencenighe (Belluno), Pederobba (Treviso), Silvi Marina (Teramo), Rovereto (Trento), Città Sant’Angelo (Pescara) and Lauriano (Turin), currently closed because of the Coronavirus (La Repubblica, 2020). They are mostly dedicated to the luxury eyewear production, and in 2018 they represented 43% of the global production output (Graph 3). In particular, these Italian factories are at the basis of Luxottica’s luxury frames production, since they integrate the tradition of Italian craftsmanship acquired inside the Belluno eyewear district with the efficiency and speed of the modern automation. As it will be explained in more detail in paragraph 4.3, since 2010 the Chinese plant is involved in the production of plastic sun lenses to be assembled with the frames that are produced in the same place, as well as the manufacturing of frame decorations and details. In the United States, more precisely in California, are manufactured optical frames and lenses and sports eyewear for the Oakley brand. The factories in Brazil, Japan and India, on the other hand, serve the corresponding local markets.

Graph 3: Distribution of the Luxottica’s production output in 2018



Source: Luxottica Annual Report, 2018, p. 17

Over the years, Luxottica has gradually expanded its technology and mix of materials for the eyewear production, from the traditional metal, nylon fibre and acetate slabs to comprise wood, aluminium, fabrics, die casting, the innovative *LiteForce* (a special material from the aerospace industry), and lastly graphene, the revolutionary material that the Italian firm introduced for the first time in the eyewear industry. In this regard, both Europe and China represent the main sources from which Luxottica acquired these raw materials, thanks to more than 2000 suppliers.

The most used materials are metal, acetate and nylon fibre, which allow the creation of two main typologies of frame (plastic and metal), on the basis of specific moulds and models (Luxottica Annual Report, 2018).

Concerning the metal frames, their manufacturing process is divided in approximately 70 different stages, that begin with the creation of basic components like bridges, temples and rims through a moulding process. Successively, the components are welded together to make frames in several stages of accurate assembly process. When the frames are assembled, these are treated with numerous coatings to increase their resistance and improve the aesthetic. Then they are prepared for lens fitting, and lastly, they are packaged (Luxottica Annual Report, 2018). On the other hand, the plastic frames are produced utilising either an injection or milling moulding process. In the first type of process, the plastic resins are initially liquefied and then injected into moulds. In the second typology of process, through a computer-controlled machine, the frames are carved from different coloured acetate slabs. The result of this process is the creation of temples, bridges and rims which are assembled, finished, and lastly packaged. Particularly important in the last phases of the manufacturing process is the decoration phase, mainly concerning the luxury models. This step, in fact, makes the frames wearable works of art thanks to the combination of innovative technologies and the know-how of expert artisans, who work on every component with passion and scrupulous attention to detail. The precise and skilled work of manufacturers is inimitable, and it constitutes an essential part in each production phase: a heritage of knowledge and know-how that has been passed down, unaltered in the course of time and another proof of Luxottica's quality (Luxottica, 2019).

Lastly, it is essential to underline the production of lenses (for sunglasses and eyeglasses) in-house, that Luxottica has gradually improved in the course of time with the aim of creating a complete eyewear. In particular, as explained in detail in the Second Chapter,

the production of sun lenses started thanks to the various knowledge and competencies acquired with the numerous acquisitions, especially of Ray-Ban, Persol, and Oakley, the main leader in the sunglasses segment. In detail, the role played by the Foothill Ranch facility in California, which manufactures and assembles Oakley's eyewear products for Luxottica, has been fundamental both in the manufacturing of high-performance sunglasses, but also in the beginning of the manufacturing of prescription frames and lenses since 2007.

A turning point in the production of ophthalmic lenses, moreover, is represented by both the merging with Essilor in 2018 and also the acquisition of Barberini in 2019. Two crucial factors that allowed Luxottica to pursue a continuous research for the highest level of vertical integration. In addition, it is relevant to highlight the role played by the Lauriano plant in Turin in the reinforcement of the production of sun lenses for the Luxottica proprietary brands. This plant, in fact, is the point of reference for Luxottica thanks to its various roles. Besides being a production plant of lenses in crystal and synthetic resins, it is a research and development laboratory focused on the latest innovations, and also a strategic logistics centre.

4.2.1.2) From logistics to the final consumer

Once the product is packaged, it is entrusted to Luxottica's distribution system, consisting of 18 distribution centres, and one of the most efficient and advanced in the eyewear industry.

The logistics system is globally integrated, and it serves both the retail as well as wholesale businesses that, in their turn, are linked to the production facilities. Furthermore, the distribution system of the Italian firm is managed by a centralised manufacturing platform which is focused on the daily monitoring of the inventory levels and the global sales performance to rapidly respond to the local market demand (Luxottica, 2019).

There are four key distribution hubs located in strategic areas serving Luxottica's main markets. One of these is located in Sedico (Belluno), it was opened in 2001 and it represents one of the most important and technically advanced hubs in the eyewear sector, succeeding to ship around 245,000 units every day to customers in Europe,

Mexico, Turkey, Middle East, Africa, and specific United States markets and other Luxottica's distribution centres around the world.

Another important hub is placed in China, more precisely in Gaobu Town, Dongguan. This Chinese hub was opened in 2006 and, since it serves the Asia-Pacific region, it is an important strategic part of Luxottica's distribution network, since it manages about 205,000 units daily. However, because of the Coronavirus, the closure of this hub has caused important disruptions in Luxottica's value chain, forcing the firm to shift part of the distribution devoted to the Asian market to other hubs, with unavoidable slowdowns and difficulty of transport (Corriere delle Alpi, 2020).

A third relevant hub is located in Atlanta. This distribution centre, opened in 1996, has combined numerous North America-based facilities into a single advanced distribution centre, near one of United States' core airport hubs. Moreover, this hub is able to manage an average of 180,000 units every day. These three hubs comprise laboratories producing ophthalmic lenses and frames that, through an efficient logistics, serve the Asia-Pacific, North American, and European markets.

The last hub, in Jundiaí (Brazil), is the most recent and small among those mentioned. In fact, it was established in 2013, and it manages only about 25,000 units daily.

As it was underlined in the paragraph 4.2.1, Luxottica works directly forward in the channels of wholesale, retail and e-commerce distribution. In this regard, the high level of forward vertical integration in relation to both advanced as well as developing markets, guarantees the Italian firm numerous advantages, mainly regarding the enlargement of its portfolio of licensed and proprietary brands, the satisfaction of wholesale clients and retail consumers, and also the improvement of knowledge in relation to processes and products.

The wholesale distribution network operates in more than 150 countries globally, with about 50 commercial subsidiaries in developed countries, and approximately 50 independent distributors in other emerging markets.

The wholesale clients, who are supported by efficient pre- and post-sale services, are mainly retailers of mid to premium-priced glasses, like optical retail chains, speciality sun retailers, independent opticians, subdivision stores, online clients and duty-free shops. Furthermore, some brands, like Oakley, are distributed to sporting goods shops. For this reason, since Luxottica's products are sold both directly and indirectly to customers, in this segment of the value chain, the vertical integration is only partial.

In supporting the wholesale distribution, Luxottica launched the STARS program in 2002: as already underlined in the Second Chapter, this program directly organises and manages product selection activities, the automatic replacement of products in the stores, the assortment planning, exploiting ad hoc systems and advanced planning techniques, and consequently strengthening the relationships with customers. This program has become so important that in 2018 it served more than 10,300 stores in the main European, Middle East, and United States markets.

About the retail distribution, it is relevant to underline that in 2019 Luxottica operated with approximately 9,100 stores characterised by numerous different patented and licensed brands. In fact, thanks to a strong portfolio of brands (more than 30 brands), the Italian firm is well-positioned to manage every segment of the eyewear market through a wide range of differentiation elements, comprising not only its products but also the latest high-performance frames of other companies. In fact, as for the wholesale distribution, also the retail segment is characterised by a partial vertical integration.

Among the most important elements which define the vertical integration of the distribution channel is LensCrafters.

The acquisition of this strategic global retailer of prescription eyewear and sunglasses in 1995, has enabled Luxottica to acquire a strong competitive position in the eyewear market, that has further reinforced its degree of vertical integration and market knowledge. In this regard, it is also relevant to mention the acquisitions of Pearle Vision (2004), Target Optical and Sears Optical (2004) as other significant eyewear retailers that allow Luxottica to efficiently operate in the United States, and to gain more rapidly important information concerning the American market. Another important optical retail chain acquired by Luxottica is Sunglass Hut (2001), that is mainly specialised in the sunglasses segment, and it is focused on both emerging and developed countries, such as Chile, India, Brazil, Mexico and numerous Asian areas. Moreover Luxottica operates through EyeMed Vision Care that was acquired in 1999. It is the second-biggest vision benefits company in the United States and it is specialised in providing insurance services for vision care.

Concerning the Oakley brand (2007), the “O” stores allow Luxottica to operate globally, providing a full range of Oakley products that includes apparel, footwear, sunglasses, and sportswear accessories (Luxottica, 2019).

In the Italian panorama, a significant factor which has contributed to the development of Luxottica's vertical integration was the acquisition of Salmoiraghi & Viganò in 2016. This important strategic operation, as explained in the Second Chapter, has guaranteed Luxottica to manage and exploit one of the largest Italian optical chains. Furthermore, it is particularly relevant to observe that, in numerous Luxottica's stores involved in the eyeglasses segment, the Italian firm provides advanced eyecare services. For instance, LensCrafters adopts the *AccuFit Digital Measurement System* to find the exact location of the pupil: a measure that is five times more precise than traditional methods (LensCrafters, 2020).

Lastly, the third distribution channel employed by Luxottica is the e-commerce. In this regard, Luxottica provides clients a premium online shopping experience through numerous websites that drive brand awareness and allow customers to buy products directly, expanding customer service even within the digital space.

Among the most important websites, a key role is played by Ray-Ban.com. In fact, after being launched in the United States in 2009, it currently operates in 26 countries (Luxottica, 2019). In detail, this website offers a wide variety of Ray-Ban exclusive offerings, and also a unique consumer experience thanks to the Ray-Ban Remix launched in 2013: an online platform that allows to customise material, lens colour, and other features of Ray-Ban frames.

In addition to Ray-Ban.com, another relevant website is Oakley.com that, working in 21 countries, provides a digital window on the enormous assortment of Oakley products. In particular, besides the purchase of eyewear, the website also allows to personalise some models.

A third website is SunglassHut.com that, after being launched in 2008, has become the digital platform in which it is possible to find both the most popular premium sunglasses as well as the newest trends.

Lastly, in addition to other online platforms, like Glasses.com (2014), new Persol.com (2017) and Vogue Eyewear.com (2017), in 2018 Luxottica made strategic agreements in China in order to open both Oakley and Ray-Ban stores in Tmall.com, the world's second-largest *business-to-consumer* (B2C) online retail (Luxottica, 2019).

4.3) Internationalisation: the delocalisation of Luxottica in China

Vertical integration has brought the Italian firm to expand its entrepreneurial footprint globally. As it is underlined in paragraph 2.2.1, since the 1980s, Luxottica has begun a strong process of penetration of international markets through the opening of numerous wholesale subsidiaries, manufacturing facilities, retail stores, and distribution centres, and also through the creation of some joint-ventures that have further reinforced its degree of vertical integration.

If we focus on the Chinese market that, together with the Indian and Japanese markets represented the second largest market in terms of global distribution of production output in 2018 (Graph 3), the strategic approach of internationalisation adopted by Luxottica in East Asia started in 1997. In particular, what brought the Italian firm to delocalise part of the production process in this area was mainly its exponential growth in terms of product demand and the necessity of differentiation. In fact, because of more favourable conditions regarding lower prices and rapidity of production in contrast to the Belluno eyewear district, the Chinese market guaranteed better perspectives in satisfying the increasing eyewear demand. For this reason, at the beginning of 1997 Luxottica established in Dongguan (China) the Tristar Optical Co. Ltd. (Fashion Magazine, 2007), in order to delocalise part of the production of plastic components in this production hub, and simultaneously satisfy the eyewear demand from the other markets of reference.

Over the course of time, in line with the exponential growth of Luxottica in the international market and with the consolidation of a business model increasingly vertically integrated, the Italian firm has transformed Tristar into a real headquarter. In fact, this hub has been converted to integrate every stage of the production cycle, instead of outsourcing the phases to outside suppliers, in order to maintain a high level of control and efficiency of the manufacturing process.

Currently, there are three main factories in China, and Tristar operates as Luxottica's principal production and distribution hub in this country. This, together with the distribution hub in Gaobu Town, has allowed to perfectly recreate Luxottica's Italian factory model inside the Dongguan area, able to serve all consumers across the entire Asia-Pacific region. Moreover, in 2016 the size of the Tristar hub increased threefold, and it was modernised with innovative technologies and a new ophthalmic lens laboratory (Luxottica, 2017).

In recent years, Dongguan has become a crucial industrial pole for Luxottica, initially dedicated to the mere production of plastic components for the low-end eyewear, it was successively converted to become an enormous site for manufacturing components, frames, and glasses decorations with the same quality and precision of the other Italian plants, and characterised by cutting-edge technologies, innovative production processes and distribution systems. Moreover, within this industrial area, besides prototyping and local design departments, a skills laboratory was established to develop the same technologies and improve the industrial robotics systems utilised in Italy. This approach to innovation in the Chinese territory makes it possible to generate ever smarter advanced and highly customised solutions, as well as to acquire and take advantage of a unique know-how to exploit inside the eyewear industry.

Moreover, the massive industrial development made by Luxottica in the larger Guangdong area has favoured the business growth in the broad Chinese market, consequently increasing the customers' demand for its *Made in Italy* eyewear models. This expansion has brought Luxottica to have three enormous factories supported by a local distribution centre to serve all the Asian-Pacific market, as well as a network of around 300 stores in China, comprising nearly 90 Ray-Ban stores and approximately 60 Sunglass Hut locations, that Luxottica is gradually enlarging. From this perspective of analysis, it is clear how the initial choice of delocalising part of the production in China proved to be a winning strategy. In fact, the Chinese market has guaranteed the necessary factors to rapidly and efficiently respond to the eyewear demand at the beginning of Luxottica's international expansion and successively allowed a strategic expansion in the Asian area, with a consequent intensification of its vertical integration.

4.3.1) Import and export of knowledge

Luxottica is constantly focused on the research of new competencies and skills, to the extent that the strategies undertaken to grow the business in a new country have at their basis the aim of innovating and creating a common sense of belonging to the Group (for instance, the Luxottica's employees are called "Luxoticans").

As an international firm, Luxottica codifies and values several different cultures as well as specific characteristics of a large variety of consumers and markets. In particular, it

supports the local development exporting the best standards, creativity, *Made in Luxottica*, quality and innovation in its sites located worldwide and, simultaneously, importing new inspirations and capabilities from them (Luxottica Annual Report, 2018). In order to enhance knowledge and know-how, Luxottica focuses on the continuous training of its workforces, not only to improve individual competencies but also to create the right conditions to expand the pool of knowledge inside the firm, contributing to its development and future expansion. For this reason, every new worker is recruited with its knowledge, values, and know-how, guaranteeing a high level of differentiation within the company in order to favour the process of creation of new knowledge.

Since for Luxottica the main element for the growth of the firm is education, it offers a wide variety of selected training courses with performance evaluations inside the “Luxottica University”, a training centre inside each firm’s sites. In this regard, Luxottica provides its employees with the right instruments and opportunities to reach their potential through specific training activities. In particular, it is mainly used Luxottica’s “Learning Advisor” online platform, based on a direct dialogue between the employee and a direct manager of reference to outline a professional development plan (Saltini, 2017). Luxottica develops different training courses in relation to each country in which it is established, focusing on the improvement of the skills and competencies that are considered essential to preserve the high level of quality of the product and the competitiveness of the Group. Consequently, in supporting the centralisation process of training activities in 2018 the “Luxottica University” digital platform was created, accessible to all Luxottica’s employees from all the geographical areas, both online as well as in classrooms and stores (Luxottica, 2019).

The platform provides contents in about 20 different languages, exporting knowledge, information and skills in order to upgrade the human capital, and simultaneously import competencies related to the market of reference, its customers and their requirements. Furthermore, the platform allows to rapidly exchange knowledge in terms of innovation of product and process deriving from the numerous areas in which Luxottica is localised. In this perspective of analysis, the presence of the Italian firm in China, which dates back to more than 22 years, gives a clear example of market adaptation deriving from the right balance between import and export of knowledge.

The purpose of truly comprehending the Chinese culture, and of having a valuable and constant interaction with institutions and customers has allowed the Italian firm to fit in

perfectly and, in this way, to become an important element which contributes to the economic and social growth of the region.

The strong propensity to invest in local and global learning has enabled Luxottica to adapt without difficulty to the Chinese market through the creation of a product in line with Asian design and the specific facial features of customers. In particular, through the combination of the competencies of Chinese designers and the know-how of Italian artisans, since 2009 Luxottica is manufacturing the entire Ray-Ban collection on the basis of the trends and physical characteristics of local customers: for instance, the nose pads are lengthened and curved, and the temples are longer and more curved than international glasses (De Luca, 2015). Moreover, a key role is played by the numerous training initiatives organised by Luxottica. In addition to “Luxottica University”, in China in 2009 the “China Fresh” talent program is founded, based on a three-year training course for individuals who joined the firm after their graduation, in order to develop specific competencies in line with the Chinese culture that are successively exported in other Luxottica’s structures to upgrade the existing knowledge. It emerges, hence, how Luxottica is deeply focused on the maximisation of product quality and the satisfaction of customers.

The importance of constant innovation, mainly in terms of product offering, is particularly essential in the Chinese market, where the Italian firm must continuously confront a highly internationalised and competitive environment and, for this reason, it is brought to grow its business approach in terms of import and export of knowledge. In this regard, it is fundamental an efficient cooperation and organisation among all the different business areas of the Group in order to favour the process of knowledge flows among them.

4.4) Potential changes on Luxottica’s value chain caused by Covid-19

Regarding the analysis on the effects caused by the Coronavirus on global value chains examined in the Third Chapter, it is now important to underline the effects of Covid-19 pandemic on Luxottica’s value chain and the potential changes that it could bring to the Italian firm. Although the vertical business model has guaranteed several advantages in terms of efficiency of the production process and a higher control of market conditions in

the eyewear industry, the current international economic and health crisis due to Covid-19 is creating many slowdowns and variations in the mechanisms which regulate Luxottica's value chain, mainly because of the lockdown of the production and distribution plants in China, one of the key areas for the firm. In this regard, considering Figure 12 as a support for this analysis, the effects of Coronavirus are mainly evident on the segments concerning the upstream integration which, in their turn, in the long-run may create several transformations in the management of the elements that are part of the downstream integration.

Since the last part of January 2020, the stoppage of the main economic activities in China, in accordance with the global governments directives to contain the pandemic, has had significant impacts in Luxottica's production capacity (Corriere delle Alpi, 2020). In particular, since China has been the most affected area, being the first territory from which Covid-19 has emerged and spread, the closure of Luxottica's three local manufacturing facilities has brought the firm to adopt a series of rapid strategic initiatives to guarantee the functioning of its value chain. On one hand, Luxottica has relocated the production of glasses, sunglasses and lenses in the other numerous manufacturing facilities and laboratories located into the countries not yet forced to stop all their economic activities, such as Brazil and India. On the other hand, the firm has activated a re-shoring process in Italy inside the production site of Agordo, Sedico and Cencenighe. Moreover, this has led to a consequent resizing of the main suppliers for raw materials, mainly of plastic materials and metals, localised in the Asian areas.

The manoeuvres adopted by Luxottica have inevitably overloaded the other production and distributions centres readapted to counter the lack of operativity of the Chinese sites. However, the management of this economic and health crisis by the Italian firm has guaranteed the continuity of the production and distribution cycle for the Asian market. Although since the beginning of March 2020 the effects of Covid-19 have negatively affected also the economic activities in both the United States and Europe, two of the most important areas in terms of manufacturing and distribution networks for Luxottica, the efficiency of the global productive networks has enabled to satisfy the product demand of the two markets of reference. In this regard, a key role is played by the well-organised e-commerce channels that enable to acquire Luxottica's products even if all the physical structures are closed. From this perspective of analysis, although the manufacturing sector is one of the main sectors negatively affected by the economic crisis caused by

Covid-19, it seems that Luxottica is efficiently countering the numerous problems deriving from the pandemic, especially in terms of production and logistics. However, the slowdowns and interruptions underline that potential long-run effects due to the economic crisis on the mechanisms which regulate Luxottica's value chain could bring to its reconfiguration. In this regard, it is possible a relocation of all Luxottica's production and distribution sites into the Eurozone with specific channels to serve all the main markets of reference. This strategic approach, in fact, would guarantee a better efficiency in terms of control and organisation of the supply chain in case of a prolonged lockdown of the major hubs in Asia and the United States. Moreover, this type of manoeuvre would lead to a resizing of the suppliers of raw materials and finished products. For this reason, there might be a decrease of Luxottica's productive capacity, with a consequent reduction of the variety of the eyewear models.

The hypotheses above mentioned allow to comprehend the possible scenarios in Luxottica's value chain in the case of prolonged effects of the Coronavirus on the global economic and political mechanisms, effects that could lead Luxottica to a reduction of the competitive strength over rivals, which could pave the way to new actors in the eyewear industry.

CONCLUSION

The purpose of the thesis has developed through the analysis of the industrial district from the knowledge-based perspective, focusing the attention on comprehending how this local productive system can be defined as a source of knowledge creation and regeneration. In this regard, the economic literature concerning the interpretation of the industrial district phenomenon has provided numerous viewpoints whose reading key is built around the characterisation of this organisational model of production as a cognitive laboratory. It is underlined how the historical development of industrial districts and the consolidation of their model of industrial organisation have been mainly favoured by the districts' capacity to operate as contexts highly specialised and flexible to market's circumstances. This aspect has been particularly evident in Italy where, since the 1970s, the inadequacy in responding to a more differentiated demand shown by the model of production based on the standardisation of products has given relevance to the capacity of industrial districts to create a productive environment defined by adaptability and specialisation. These peculiarities, as it is explained in the thesis, are a direct consequence of the creation of both a well-organised model of production as well as the formation of a dynamic socio-economic environment in which the propagation of knowledge and know-how among firms is supported by their spatial proximity and a common entrepreneurial culture of interaction which favour the process of creation of new knowledge. From this perspective of analysis, it is clear how the interpretation of the industrial districts as cognitive laboratories results in their configuration as meta-contexts, characterised by definite conditions for knowledge generation and regeneration.

The analysis of the Belluno eyewear district's growth and, in particular, the motivations at the basis of its high degree of manufacturing specialisation, have allowed to confirm the importance that the improvement of knowledge has into the development mechanisms of the industrial districts and their innovation processes. In this regard, it is highlighted how the industrial atmosphere and the collaboration among district firms, that have characterised the Belluno local system of production mainly during its initial distrettualisation process begun in the 1940s, have favoured the spread of different manufacturing competencies and know-how, favouring the enlargement of the pool of local knowledge. For this reason, the inclination shown in the continuous renovation of

the productive competencies has allowed the Belluno eyewear district to become the main point of reference in the international panorama for the production of eyewear, especially in terms of quality and innovation of product. Thus it is underlined how, although the Belluno industrial district's growth has gradually changed because of the affirmation of some local leader firms (Luxottica, Safilo, Marchon, Marcolin and De Rigo) in the global competitive panorama and their processes of vertical integration, leading to a deterioration of the socio-cultural context and the cooperation among district firms in terms of knowledge combination and transfer, in these last years many local institutions are trying to renew the industrial atmosphere that was at the basis of the origin of the Belluno local system in line with the dynamics of a worldwide competitive scenario. In particular, a key role is played by Certottica that, besides being the main institution of certification of optical products, it is focused on the conservation of the inimitable skills and capabilities of the pioneering artisans of Belluno as well as the upgrading of knowledge and its sharing among the economic actors, which decide to interrelate with the Belluno eyewear district through specific initiatives and training courses. This approach, on one hand, allows the creation of new knowledge through its dissemination and absorption among the subjects involved and, on the other hand, enables the local productive system to continuously innovate.

By analysing the cyclical process of innovation within the industrial districts, it becomes clear how the local production systems are not only defined as cognitive systems but also as systems of local innovation. In particular, knowledge management within the cognitive mechanisms of the industrial districts allows them to become sources of new knowledge and, consequently, specific contexts for the local innovation processes. In this regard, it is underlined the importance of the knowledge absorptive capacity carried out by the district firms, both inside as well as outside the district environment, as the key factor in creating efficient conditions through which knowledge is acquired, assimilated, transformed and exploited to generate a dynamic cognitive environment. Thus it is emphasised that, although the process of vertical integration adopted by Luxottica as a reinforcement of its international growth has led to diminish the relationships with the Belluno industrial district, this local production system has proven to be an essential source of knowledge for the Italian firm. In fact, through an efficient vertical integration of the value chain, the pool of competencies acquired inside the district environment has been the driver to efficiently absorb the knowledge gained from the process of

internationalisation in the global eyewear market, and consequently, to create specific conditions for the firm's development and innovation. For these reasons, it is clear how the interpretation of the industrial district as a source of knowledge creation and regeneration has to be read on the basis of its capability in creating specific cognitive settings. These, in their turn, enable district firms to efficiently exploit the flows of knowledge inside the local production environments in order to gain specific knowledge assets that allow them to develop and acquire competitive advantage inside their range of action. It becomes fundamental the continuous renovation of the mechanisms which guarantee an efficient creation and regeneration of knowledge, especially through a perfect coordination and cooperation among the district actors involved in the processes of development of the industrial districts.

REFERENCES

- Albino, V., Garavelli, C. A., & Schiuma, G. (1998). "Knowledge Transfer and Inter-Firm Relationships in Industrial Districts: The Role of the Leader Firm". *Technovation*, Vol. 19, No. 1, pp. 53-63.
- Alexiadis, S. (2013). *Convergence Clubs and Spatial Externalities: Models and Applications of Regional Convergence in Europe*. Heidelberg: Springer.
- Amador, J., & Di Mauro, F. (2015). *The Age of Global Value Chains: Maps and Policy Issues*. London: Centre for Economic Policy Research (CEPR).
- ANFAO. (2007, May 3rd). *Comunicati Stampa*. Retrieved from anfao.it: https://www.anfao.it/documents/comunicati/dettaglio_2007_anticipo_2008_1469627967728.pdf.
- ANFAO. (2008, May 3rd). *Comunicati Stampa*. Retrieved from anfao.it: <https://www.anfao.it/pages/comunicati?archive=1>.
- ANFAO. (2010, September 17th). *Comunicati Stampa*. Retrieved from anfao.it: https://docs.google.com/gview?url=www.anfao.it/documents/comunicati/comunicato_stampa_17settembre2010_146962689817.doc.
- ANFAO. (2016, February 1st). *Comunicati Stampa*. Retrieved from anfao.it: https://www.anfao.it/documents/comunicati/CS_dati_Anfao_MIDO_2016_DEF_1469619598106.pdf.
- ANFAO. (2019, February 28th). *Comunicati Stampa*. Retrieved from anfao.it: https://www.anfao.it/documents/comunicati/CS%20ANFAO%20chiusura%20settore%202018_1551369766924.pdf.

- ANFAO. (2020, June 25th). *Comunicati Stampa*. Retrieved from anfao.it: https://www.anfao.it/documents/comunicati/CS%20ANFAO%20chiusura%20settore%202019%20e%20previsione%202020%20def_1593080082589.pdf.
- Argote, L., & Ingram, P. (2000). "Knowledge Transfer: A Basis for Competitive Advantage in Firms". *Organizational Behavior and Human Decision Processes*, Vol. 82, No. 1, pp. 150-169.
- Arrighetti, A., Landini, F., & Lasagni, A. (2014). "Intangible Assets and Firm Heterogeneity: Evidence from Italy". *Research Policy*, Vol. 23, No. 1, pp. 202-213.
- Arrow, K. (1971). "The Economic Implications of Learning by Doing". In F. H. Hahn, *Readings in the Theory of Growth* (pp. 131-149). London: Palgrave Macmillan.
- Asheim, B. T., & Parrilli, M. D. (2012). *Interactive Learning for Innovation*. London: Palgrave Macmillan.
- Bagella, M., & Becchetti, L. (2000). *The Competitive Advantage of Industrial Districts: Theoretical and Empirical Analysis*. Heidelberg: Physica-Verlag.
- Bagnasco, A. (1977). *Tre Italie: La Problematica Territoriale dello Sviluppo Italiano*. Bologna: il Mulino.
- Bapuji, H., & Crossan, M. (2004). "From Questions to Answers: Reviewing Organizational Learning Research". *Management Learning*, Vol. 35, No. 4, pp. 397-417.
- Baumard, P. (1999). *Tacit Knowledge in Organizations*. London: SAGE Publishing.
- Becattini, G. (1978). "The Development of Light Industry in Tuscany: An Interpretation". *Economic Notes: Economic Review of Banca Monte dei Paschi di Siena*, Vol.7, No. 2/3, pp. 107-123.

- Becattini, G. (1979). *Dal Settore Industriale al Distretto Industriale. Alcune Considerazioni sull'Unità di Indagine dell'Economia Industriale*. Bologna: il Mulino.
- Becattini, G. (1987). *Mercato e Forze Locali: Il Distretto Industriale*. Bologna: il Mulino.
- Becattini, G. (1989). "Riflessioni sul Distretto Industriale Marshalliano come Concetto Socio-Economico". *Stato e Mercato*, Vol. 1, No. 25, pp. 111-128.
- Becattini, G. (2000). *Distretti Industriali e Made in Italy: Le Basi Socioculturali del Nostro Sviluppo Economico*. Turin: Bollati Boringhieri.
- Becattini, G. (2000). *Il Bruco e la Farfalla: Prato nel Mondo che Cambia (1954-1993)*. Florence: Le Monnier.
- Becattini, G. (2004). *Industrial Districts: A New Approach to Industrial Change*. Cheltenham: Edward Elgar Publishing.
- Becattini, G. (2007). *Il Calabrone Italia: Ricerche e Ragionamenti sulla Peculiarità Economica Italiana*. Bologna: il Mulino.
- Becattini, G., & al. (2003). *From Industrial Districts to Local Development: An Itinerary of Research*. Northampton: Edward Elgar Publishing.
- Becattini, G., & Musotti, F. (2003). "Measuring the District Effect. Reflections on the Literature". *PSL Quarterly Review*, Vol. 56, No. 226, pp. 259-290.
- Becattini, G., & Rullani, E. (1993). "Sistema Locale e Mercato Globale". *Economia e Politica Industriale*, Vol. 80, pp. 25-48.
- Becattini, G., & Sforzi, F. (2002). "Prospettive dello Sviluppo Locale sotto forma di Esame Critico di Dieci Anni di Incontri Artiminesi". In G. Becattini, & F. Sforzi, *Lezioni sullo Sviluppo Locale* (pp. 9-39). Turin: Rosenberg & Sellier.

- Bellandi, M. (2003). *Mercati, Industrie e Luoghi di Piccola e Grande Impresa*. Bologna: il Mulino.
- Bellandi, M., & De Propris, L. (2015). "Three Generations of Industrial Districts". *Investigaciones Regionales-Journal of Regional Research*, Vol. 32, pp. 75-87.
- Belussi, F., & Caldari, K. (2009). "At the Origin of the Industrial District: Alfred Marshall and the Cambridge school". *Cambridge Journal of Economics*, Vol. 33, No. 2, pp. 335-355.
- Belussi, F., & Pilotti, L. (2002). "Learning and Innovation by Networking Within the Italian Industrial Districts: The Development of an Explorative Analytical Model". *Sinergie-Italian Journal of Management*, Vol. 58, pp. 3-43.
- Best, M. H. (1990). *The New Competition: Institutions of Industrial Restructuring*. Cambridge: Harvard University Press.
- Betti, F., & Kristian, H. P. (2020, February 27th). *Coronavirus is Disrupting Global Value Chains. Here's How Companies Can Respond!* Retrieved from weforum.org: <https://www.weforum.org/agenda/2020/02/how-coronavirus-disrupts-global-value-chains/>.
- Bianchini, F. (1991). "The Third Italy: Model or Myth?". *Ekistics*, Vol. 58, No. 350/351, pp. 336-345.
- Boito, L. (2020, February 5th). "Interview to Luigino Boito, Chairman of Certottica". (L. Marcon, Interviewer).
- Bonacci, I. (2007). *Lo Sviluppo Organizzativo dei Distretti Industriali. Il Ruolo dell'ICT*. Milan: FrancoAngeli.

- Boyer, J. C., & Brunet, R. (1989). *Les Villes "Européennes": Rapport pour la DATAR, Délégation à l'Aménagement du Territoire et à l'Action Régionale*. Paris: Documentation Française.
- Bramanti, A., & Gambarotto, F. (2008). *Il Distretto Bellunese dell'Occhiale. Leadership Mondiale e Fine del Distretto?* Milan: Scheiwiller.
- Bratinau, C., & Orzea, I. (2010). "Organizational Knowledge Creation". *Management, Marketing Challenges for Knowledge Society*, Vol. 5, No. 3, pp. 41-62.
- Brunetti, G., & Camuffo, A. (2001). *Del Vecchio e Luxottica. Come Si Diventa Leader Mondiali*. Turin: ISEDI.
- Brusco, S. (1990). "The Idea of the Industrial District: Its Genesis". In F. A. Pike, G. Becattini, & S. Werner, *Industrial Districts and Inter-Firm Co-operation in Italy* (pp. 10-19). Geneva: International Institute for Labour Studies.
- Brusco, S. (1992). "Small Firms and the Provision of Real Services". In F. Pyke, & W. Sengenberger, *Industrial Districts and Local Economic Regeneration* (pp. 177-196). Geneva: International Institute for Labour Studies.
- Brusco, S. (1993). "Il Modello Emiliano Rivisita il Distretto. Regione e Industria". *Politica Economica*, Vol. 24, No. 1, pp. 47-55.
- Brusco, S., & Bigarelli, D. (1995). "Struttura Industriale e Fabbisogni Formativi nei Settori della Maglieria e delle Confezioni in Italia. Un'analisi per Regione 1993". *Rivista Italiana di Economia*, No. 1, pp. 7-47.
- Brusco, S., & Sabel, C. F. (1981). *Artisan Production and Economic Growth*. London: Academic Press.
- Brusco, S., Natali, A., Russo, M., & Solinas, G. (2007). *Distretti Industriali e Sviluppo Locale: Una Raccolta di Saggi (1990-2002)*. Bologna: il Mulino.

- Busacca, B., & Costabile, M. (2018). *Marketing. Una Disciplina Fantastica: Omaggio a Enrico Valdani*. Milan: EGEA.
- Calcagno, M., Faccipieri, S., & Rullani, E. (2000). *L'Analisi della Filiera Produttiva nel Comparto dell'Occhialeria di Belluno*. Belluno: Belluno Chamber of Commerce.
- Cameron, D. R. (2020, June 19th). *European Council Discusses Commission Plan for €750 Billion Recovery Fund*. Retrieved from europeanstudies.macmillan.yale.edu: <https://europeanstudies.macmillan.yale.edu/news/european-council-discusses-commission-plan-eu750-billion-recovery-fund>.
- Camuffo, A., & Grandinetti, R. (2011). "I Distretti Industriali come Sistemi Locali di Innovazione". *Sinergie-Italian Journal of Management*, Vol. 69, pp. 33-60.
- Cangiani, M. (2001). "L'Evoluzione dell'Industria Bellunese degli Occhiali e la Teoria dei Distretti Industriali". *Economia e Società Regionale*, Vol. 19, No. 2, pp. 118-134.
- Canino, I., Fanti, G., Foscari, F., Graffi, L., Immordino, M., Novarese, A., . . . Storchi, M. C. (2020, April 10th). *The 'Cure Italy' and 'Restore Liquidity' Decrees: Keeping Italian Companies Alive?* Retrieved from whitecase.com: <https://www.whitecase.com/publications/alert/cure-italy-and-restore-liquidity-decrees-keeping-italian-companies-alive>.
- Capello, R. (2015). *Economia Regionale. Localizzazione, Crescita Regionale e Sviluppo Locale*. Bologna: il Mulino.
- Carminucci, C., & Casucci, S. (1997). "Il Ciclo di Vita dei Distretti Industriali: Ipotesi Teoriche ed Evidenze Empiriche". *L'industria*, Vol. 18, No. 2, pp. 283-316.
- Casonato, C., & Harris, J. (1999). "Can an Enterprise Really Capture "Tacit Knowledge"?: We Answer Two Top Questions on Knowledge Management from the Electronic Workplace 1999 Conference". *Group Research Note Select Q&A*.

- Castelli, M. (2014, September 8th). *Luxottica: Tanto Rumore (di... Guerra) per Nulla*. Retrieved from [economiaitaliana.it](http://www.economiaitaliana.it):
<http://www.economiaitaliana.it/it/articolo.php/Luxottica-tanto-rumore-di-Guerra-per-nulla?LT=IMPRES&ID=13521&ARCHIVIO=1>.
- CCIAA Treviso-Belluno. (2019, May 8th). *Distretto dell'Occhialeria Bellunese*. Retrieved from [trevisobellunosystem.com](https://www.trevisobellunosystem.com):
<https://www.trevisobellunosystem.com/tvsys/home/archivio-news/schedaNews.asp?idNews=13406&settores=distretto-dellocchialeria-bellunese.html>.
- Cohen, W. M., & Levinthal, D. A. (1990). "Absorptive Capacity: A New Perspective on Learning and Innovation". *Administrative Science Quarterly*, Vol. 35, No. 1, pp. 128-152.
- Confindustria Belluno Dolomiti. (2010). *Rapporto sulla Filiera dell'Occhiale*. Retrieved from [reviviscar.it](https://www.reviviscar.it): <https://www.reviviscar.it/>.
- Corno, F., Reinmoeller, P., & Nonaka, I. (1999). "Knowledge Creation within Industrial Systems". *Journal of Management and Governance*, Vol. 3, No. 4, pp. 379-394.
- Corò, G. (2006). "Crescita, Convergenza, Innovazione: Una Discussione sul Modello di Sviluppo Regionale nell'UE". *Argomenti*, No. 17, pp. 37-65.
- Corò, G., & Grandinetti, R. (2001). "L'Occhialeria Bellunese: Tra Distretto e Gerarchia". *Economia e Società Regionale. Oltre il Ponte*, Vol. 19, No. 2, pp. 135-148.
- Corriere delle Alpi. (2020, March 14th). *Coronavirus, Luxottica Chiude Tutto da Lunedì a Mercoledì*. Retrieved from corrierealpi.gelocal.it:
<https://corrierealpi.gelocal.it/belluno/cronaca/2020/03/14/news/luxottica-chiude-tutto-da-domani-a-mercoledi-1.38593832>.

- Corriere delle Alpi. (2020, January 30th). *Luxottica e Safilo Chiudono fino al 10 Febbraio le Aziende in Cina*. Retrieved from [corrierealpi.gelocal.it: https://corrierealpi.gelocal.it/belluno/cronaca/2020/01/30/news/luxottica-e-safilo-chiudono-fino-al-10-le-aziende-in-cina-1.38402872](https://corrierealpi.gelocal.it/belluno/cronaca/2020/01/30/news/luxottica-e-safilo-chiudono-fino-al-10-le-aziende-in-cina-1.38402872).
- Cowan, R., David, P. A., & Foray, D. (2000). "The Explicit Economics of Knowledge Codification and Tacitness". *Industrial and Corporate Change*, Vol. 9, No. 2, pp. 211-253.
- Da Rolt, A. (2020, February 5th). "Interview with the Communication Manager of Certottica-Dolomitocert". (L. Marcon, Interviewer).
- Daft, R. L., & Lengel, R. H. (1986). "Organizational Information Requirements, Media Richness and Structural Design". *Management Science*, Vol. 32, No. 5, pp. 554-571.
- Daft, R. L., & Marcic, D. (2013). *Building Management Skills: An Action-First Approach*. Cincinnati: South-Western Publishing Company.
- Dahl, M. S., & Pedersen, C. R. (2004). "Knowledge Flows Through Informal Contacts in Industrial Clusters: Myth or Reality?". *Research Policy*, Vol. 33, No. 10, pp. 1673-1686.
- D'Amore, R., Iorio, R., & Lubrano Lavadera, G. (2014). "La Relazione tra Capitale Umano, Ricerca & Sviluppo e Innovazione a Livello d'Impresa: Un'Analisi su un Panel di Imprese Italiane". In F. Badia, & G. Cestari, *Legame tra Coesione Territoriale, Sviluppo Locale e Performance d'Impresa* (pp. 264-292). Milan: Franco Angeli.
- Dasgupta, P., & Paul, D. A. (1987). "Information Disclosure and the Economics of Science and Technology". In G. R. Feiwel, *Arrow and the Ascent of Modern Economic Theory* (pp. 519-542). London: Palgrave Macmillan.

- De Col, E. (2019, June 19th). *Sinergia tra Certottica Regione e Anfao Progetti per 1,5 Milioni*. Retrieved from [corrierealpi.gelocal.it](https://corrierealpi.gelocal.it/belluno/cronaca/2019/06/18/news/sinergia-tra-certottica-regione-e-anfao-progetti-per-1-5-milioni-1.34302715):
<https://corrierealpi.gelocal.it/belluno/cronaca/2019/06/18/news/sinergia-tra-certottica-regione-e-anfao-progetti-per-1-5-milioni-1.34302715>.
- De Luca, P. (2015). *Le Relazioni tra Innovazione e Internazionalizzazione. Percorsi di Ricerca e Casi Aziendali*. Trieste: EUT Edizioni Università di Trieste.
- De Marchi, V., Gereffi, G., & Grandinetti, R. (2017). "Distretti che Evolvono nelle Catene Globali del Valore: Lezioni di Resilienza dal Veneto." *Economia e Società Regionale*, Vol. 35, No. 2, pp. 34-43.
- Dei Ottati, G. (1987). "Il Mercato Comunitario". In G. Becattini, *Mercato e Forze Locali: Il Distretto Industriale* (pp. 117-141). Bologna: il Mulino.
- Dei Ottati, G. (1991). "The Economic Bases of Diffuse Industrialization". *International Studies of Management and Organization*, Vol. 21, No. 1, pp. 53-74.
- Dei Ottati, G. (2003). "The Governance of Transactions in the Industrial District: The 'Community Market'". In G. Becattini, M. Bellandi, G. Dei Ottati, & F. Sforzi, *From Industrial Districts to Local Development: An itinerary of Research* (pp. 73-94). Cheltenham: Edward Elgar Publishing.
- Dodgson, M. (2020). *Technological Collaboration in Industry: Strategy, Policy and Internationalization in Innovation*. London: Routledge.
- Easterby-Smith, M., Lyles, M. A., & Tsang, E. W. (2008). "Inter-Organizational Knowledge Transfer: Current Themes and Future Prospects". *Journal of Management Studies*, Vol. 45, No. 4, pp. 677-690.
- Enright, M. J. (2000). "Survey on the Characterization of Regional Clusters: Initial Results". *Working Paper, Institute of Economic Policy and Business Strategy: University of Hong Kong*, pp. 1-21.

- Evans, K., & Fraser, P. (2014). *A tale of Two Cities: Global Change, Local Feeling and Everyday Life in the North of England*. London: Routledge.
- Fashion Magazine. (2007, November 13rd). *Luxottica: 10 Anni in Cina, con Progetti Importanti in Cantiere*. Retrieved from fashionmagazine.it: <https://www.fashionmagazine.it/business/-Luxottica-10-anni-in-Cina-con-progetti-importanti-in-cantiere-13508>.
- Fischer, M. (2006). "Innovation, Knowledge Creation and Systems of Innovation". In M. Fischer, *Innovation, Networks, and Knowledge Spillovers: Selected Essays* (pp. 169-187). Berlin: Springer.
- Folta, T. B., Cooper, A. C., & Baik, Y.-s. (2006). "Geographic Cluster Size and Firm Performance". *Journal of Business Venturing*, Vol. 21, No. 2, pp. 217-242.
- Foray, D. (2004). *The Economics of Knowledge*. London: MIT Press.
- Francesconi, A., & Cioccarelli, G. (2013). *Organizzare i Distretti Culturali Evoluti*. Milan: FrancoAngeli.
- Fujita, M., & Thisse, J. (2009). "New Economic Geography: An Appraisal on the Occasion of Paul Krugman's 2008 Nobel Prize in Economic Sciences". *Regional Science and Urban Economics*, Vol. 39, No. 2, pp. 109-119.
- Gambarotto, F., & Solari, S. (2008). "Restructuring of Local Production: Two Italian Case Studies about Responses to Globalisation". *Revue d'Economie Régionale et Urbaine*, No. 1, pp. 3-20.
- Gereffi, G. (1994). "The Organization of Buyer-driven Global Commodity Chains: How U.S. Retailers". In G. Gereffi, & M. Korzeniewicz, *Commodity Chains and Global Capitalism* (pp. 95-122). Westport: Praeger.

- Gereffi, G., Humphrey, J., Sturgeon, & Timothy. (2005). "The Governance of Global Value Chains". *Review of International Political Economy*, Vol. 12, No. 1, pp. 78-104.
- Gilbert, M., & Cordey-Hayes, M. (1996). "Understanding the Process of Knowledge Transfer to Achieve Successful Technological Innovation". *Technovation*, Vol. 16, No. 16, pp. 301-312.
- Giudice, A. (2012). *Il Volo dei Calabroni. Come le PMI Italiane Vincono la Legge di Gravità*. Milan: FrancoAngeli.
- Grandinetti, R. (2002). "Indagine sui Distretti del Livenza e del Quartier del Piave". *Economia e Società Regionale*, Vol. 19, No. 1, pp. 187-220.
- Grandinetti, R., & Tabacco, R. (2003). "Industrial Districts in a Knowledge-Based Perspective: The Role of Knowledge Transfer and Knowledge Combination". In *Clusters, Industrial Districts and Firms: the Challenge of Globalization. Conference in honour of Professor Sebastiano Brusco*, https://www.researchgate.net/publication/228724585_Industrial_districts_in_a_knowledgebased_perspective_the_role_of_knowledge_transfer_and_knowledge_combination.
- Groenewegen, P. D. (1995). *A Soaring Eagle: Alfred Marshall 1842-1924*. Cheltenham: Edward Elgar Publishing.
- Guolo, A. (2019, October 12th). *Montebelluna, Uno Sport-lab che Vale 2,7 Miliardi di Euro*. Retrieved from [milanofinanza.it](https://www.milanofinanza.it/news/montebelluna-uno-sport-lab-che-vale-2-7-miliardi-di-euro-201910102014107250): <https://www.milanofinanza.it/news/montebelluna-uno-sport-lab-che-vale-2-7-miliardi-di-euro-201910102014107250>.
- Han, J. (2018). "Integration and Regional Industrial Development". *Journal of China and International Relation*, Vol. 7, No. 1, pp. 1-28.

- Hearn, W. E. (1864). *Plutology: The Theory of the Efforts to Satisfy Human Wants*. London: Palgrave Macmillan.
- Hélie, S. H., & Sun, R. (2010). "Incubation, Insight, and Creative Problem Solving: A Unified Theory and a Connectionist Model". *Psychological Review*, Vol. 117, No. 3, pp. 994-1024.
- Hellmer, S. (2010). "Switching costs, Switching Benefits and Lock-in Effects". *Energy & Environment*, Vol. 21, No. 6, pp. 563-575.
- Henderson, J., Dicken, P., Hess, M., Coe, N. M., & Yeung, H. W.-c. (2002). "Global Production Networks and the Analysis of Economic Development". *Review of International Political Economy*, Vol. 9, No. 3, pp. 436-464.
- Hidalgo, C. (2015). *Why Information Grows: The Evolution of Order, from Atoms to Economies*. Philadelphia: Basic Books.
- Huber, G. P. (1991). "Organizational Learning: The Contributing Processes and the Literatures". *Organization Science*, Vol. 2, No. 1, pp. 88-115.
- ITSCosmo. (2020, February 6th). *ITSCosmo*. Retrieved from itscosmo.it: <https://www.itscosmo.it/wp-content/uploads/2019/12/brc-cosmo-2019.pdf>.
- Jovanovic, B., & Rob, R. (1989). "The Growth and Diffusion of Knowledge". *The Review of Economic Studies*, Vol. 56, No. 4, pp. 569-582.
- Juceviciene, P., & Mazaliauskiene, R. (2013). "Looking Further Into Externalization Phase of Organizational Learning: Questions and Some Answers". In A. Green, *The Proceedings of The 10th International Conference on Intellectual Capital, Knowledge Management & Organizational Learning: ICICKM 2013* (pp. 205-211). Washington: George Washington University.

- Karlsson, C. (2010). *Handbook of Research on Cluster Theory*. Cheltenham: Edward Elgar Publishing.
- Kenney, M. (2000). *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region*. California: Stanford University Press.
- Kenton, W. (2019, May 28th). *Human Capital*. Retrieved from investopedia.com: <https://www.investopedia.com/terms/h/humancapital.asp>.
- Koestler, A. (2014). *The Act of Creation*. London: Hutchinson and Company.
- Krugman, P. (1991). "Increasing Returns and Economic Geography". *Journal of Political Economy*, Vol. 99, No. 3, pp. 483-499.
- Krugman, P. (1991). *Geography and Trade*. Cambridge: MIT Press.
- Krugman, P. (1997). *Development, Geography, and Economic Theory*. Cambridge: MIT Press.
- Krugman, P. (1998). "What's New about the New Economic Geography?". *Oxford Review of Economic Policy*, Vol. 14, No. 2, pp. 7-17.
- La Repubblica. (2020, March 22nd). *Coronavirus, Luxottica Ferma tutti gli Stabilimenti Italiani*. Retrieved from [repubblica.it](https://www.repubblica.it/economia/2020/03/22/news/coronavirus_impresa_stop-252005279/): https://www.repubblica.it/economia/2020/03/22/news/coronavirus_impresa_stop-252005279/.
- La Stampa. (2019, September 19th). *Facebook al Lavoro sugli Occhiali Intelligenti con Luxottica*. Retrieved from [lastampa.it](https://www.lastampa.it/tecnologia/news/2019/09/18/news/facebook-al-lavoro-sugli-occhiali-intelligenti-con-luxottica-1.37481081): <https://www.lastampa.it/tecnologia/news/2019/09/18/news/facebook-al-lavoro-sugli-occhiali-intelligenti-con-luxottica-1.37481081>.

L'Amico del Popolo. (2019, September 24th). *Silmo 2019, Le Aziende Bellunesi si Presentano con il Marchio «Eyewear District Belluno»*. Retrieved from [amicodelpopolo.it: https://www.amicodelpopolo.it/2019/09/24/silmo-2019-le-aziende-bellunesi-si-presentano-con-il-marchio-eyewear-district-belluno/](https://www.amicodelpopolo.it/2019/09/24/silmo-2019-le-aziende-bellunesi-si-presentano-con-il-marchio-eyewear-district-belluno/).

L'Amico del Popolo. (2020, January 17th). *La Camera di Commercio Mette 50 Mila Euro per il Nuovo Laboratorio di Certottica*. Retrieved from [amicodelpopolo.it: https://www.amicodelpopolo.it/2020/01/17/la-camera-di-commercio-mette-50-mila-euro-per-il-nuovo-laboratorio-di-certottica/](https://www.amicodelpopolo.it/2020/01/17/la-camera-di-commercio-mette-50-mila-euro-per-il-nuovo-laboratorio-di-certottica/).

Lane, P. J., & Lubatkin, M. H. (1998). "Relative Absorptive Capacity and Interorganizational Learning". *Strategic Management Journal*, Vol. 19, No. 5, pp. 461-477.

Lane, P. J., Koka, B. R., & Pathak, S. (2006). "The Reification of Absorptive Capacity: A Critical Review and Rejuvenation of the Construct". *The Academy of Management Review*, Vol. 31, No. 4, pp. 833-863.

LensCrafters. (2020, March 28th). *AccuFit*. Retrieved from [lenscrafters.com: https://www.lenscrafters.com/accufit](https://www.lenscrafters.com/accufit).

Leplat, J. (2008). "Skills and Tacit Skills: A Psychological Perspective". *Applied Psychology*, Vol. 32, No. 2, pp. 143-154.

Lionel, L. (2020, March 6th). *Your Paracetamol Supply Depends a lot on China*. Retrieved from [bloomberg.com: https://www.bloomberg.com/opinion/articles/2020-03-06/coronavirus-focus-your-pain-killer-supply-depends-a-lot-on-china](https://www.bloomberg.com/opinion/articles/2020-03-06/coronavirus-focus-your-pain-killer-supply-depends-a-lot-on-china).

Loasby, B. (1998). "The Organisation of Capabilities". *Journal of Economic Behaviour and Organization*, Vol. 35, No. 2, pp. 139-160.

Lucas, R. (1988). "On the Mechanics of Economic Development". *Journal of Monetary Economics*, Vol. 22, No. 1, pp. 3-42.

Luxottica. (2017, December 5th). *Luxottica Celebrates 20 Years of Growth and Partnership in China*. Retrieved from luxottica.com: <http://www.luxottica.com/en/luxottica-celebrates-20-years-growth-and-partnership-china>.

Luxottica. (2019, December 30th). *Company Profile*. Retrieved from luxottica.com: <http://www.luxottica.com/en/about-us/company-profile>.

Luxottica. (2019, August 30th). *La Nostra Storia*. Retrieved from luxottica.com: http://www.luxottica.com/sites/luxottica.com/modules/tt_luxhistory/pdf/Luxottica_History_ITA_WEB_10_2.pdf.

Luxottica. (2019, May 2nd). *Luxottica University, Changing the Learning Culture*. Retrieved from luxottica.com: <http://www.luxottica.com/en/luxottica-university-changing-learning-culture>.

Luxottica. (2019, April 29th). *Our Business Model*. Retrieved from luxottica.com: <http://www.luxottica.com/en/about-us/unique-approach/business-model>.

Luxottica. (2019, September 13rd). *Retail Brands*. Retrieved from luxottica.com: <http://www.luxottica.com/en/retail-brands/salmoiraghi-vigano>.

Luxottica Annual Report. (2018, December 31st). *Annual Report 2018*. Retrieved from luxottica.com: http://www.luxottica.com/sites/luxottica.com/files/luxottica_group_relazione_finanziaria_annuale_2018_eng_20190410.pdf.

Marshall, A. (1879). *The Pure Theory of Foreign Trade*. New York: Augustus M. Kelley Publishing .

Marshall, A. (1919). *Industry and Trade*. London: Palgrave Macmillan.

Marshall, A. (1920). *Principles of Economics*. London: Palgrave Macmillan.

- Marshall, A., & Marshall, M. P. (1920). *The Economics of Industry*. London: Palgrave Macmillan.
- Maskell, P. (2001). "Towards a Knowledge-Based Theory of the Geographical Cluster". *Industrial and Corporate Change*, Vol. 10, No. 4, pp. 921-943.
- Mistri, M. (2006). *Il Distretto Industriale Marshalliano tra Cognizione e Istituzioni*. Rome: Carocci Editore.
- Mitchell, R., & Boyle, B. (2010). "Knowledge Creation Measurement Methods". *Journal of Knowledge Management*, Vol. 14, No. 1, pp. 67-82.
- MondoPMI. (2019, July 24th). *Distretti Industriali: Cosa Sono e Quali Sono i più Importanti in Italia*. Retrieved from mondopmi.com: <https://www.mondopmi.com/mercati-e-settori/distretti-industriali-cosa-sono-e-quali-sono-i-piu-importanti-in-italia>.
- Morone, P. (2004). *Conoscenza, Nuove Disuguaglianze e Tecnologia dell'Informazione*. Soveria Mannelli: Rubbettino Editore.
- Myers, P. S. (2009). *Knowledge Management and Organisational Design*. London: Routledge.
- Neil, M., Brewer, J., & Plumb, J. H. (1982). *The Birth of a Consumer Society: The Commercialization of Eighteenth-Century England*. Montgomery: Indiana University Press.
- Nonaka, I. (1994). "A Dynamic Theory of Organizational Knowledge Creation". *Organization Science*, Vol. 5, No. 1, pp. 14-37.
- Nonaka, I. (2007). "The Knowledge-Creating Company". *Harvard Business Review*, Vol. 85, No.7/8, pp. 162-171.

- Nonaka, I., & Konno, N. (1998). "The Concept of 'Ba': Building a Foundation for Knowledge Creation". *California Management Review*, Vol. 40, No. 3, pp. 40-54.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford : Oxford University Press.
- Nonaka, I., & Toyama, R. (2007). "Strategic Management as Distributed Practical Wisdom (Phronesis)". *Industrial and Corporate Change*, Vol. 16, No. 3, pp. 371-394.
- Nonaka, I., Toyama, R., & Byosière, P. (2001). "A Theory of Organizational Knowledge Creation: Understanding the Dynamic Process of Creating Knowledge". In M. Dierkes, A. Berthoin, J. Child, & I. Nonaka, *Handbook of Organizational Learning and Knowledge* (pp. 491-516). Oxford: Oxford University Press.
- Nonaka, I., Toyama, R., & Konno, N. (2000). "SECI, Ba and Leadership: A Unified Model of Dynamic Knowledge Creation". *Long Range Planning*, Vol. 33, No. 1, pp. 5-34.
- Nooteboom, B. (2000). "Learning by Interaction: Absorptive Capacity, Cognitive Distance and Governance". *Journal of Management and Governance*, Vol. 4, No. 1, pp. 69-92.
- Onida, F. (2004). *Se il Piccolo non Cresce: Piccole e Medie Imprese Italiane in Affanno*. Bologna: il Mulino.
- Palmi, P. (2014). *Le Fabbriche della Creatività. Un'analisi Organizzativa Dei distretti Evoluti*. Milan: FrancoAngeli.
- Perry, M. K. (1989). "Vertical Integration: Determinants and Effects". *Handbook of Industrial Organization*, Vol. 1, No. 4, pp. 183-255.
- Picchio, N. (2020, April 29th). *Confindustria: Il Pil Peggiora tra -8 e -10%, sul Fisco Risposta Rilevante ma Tempi Lunghi*. Retrieved from ilsole24ore.com: <https://www.ilsole24ore.com/art/confindustria-pil-peggiora-8-e-10percento-fisco-risposta-rilevante-ma-tempi-lunghi-AD4cnGN>.

- Piore, M. (1990). "Work, Labour, and Action. Work Experience in a System of Flexible Production". In F. Pyke, G. Becattini, & W. Sengenberger, *Industrial Districts and Inter-firm Co-operation in Italy* (pp. 52-74). Geneva: International Institute for Labour Studies.
- Piore, M. J., & Sabel, C. (1984). *The Second Industrial Divide: Possibilities for Prosperity*. New York: Basic Books.
- Polanyi, M. (1966). *The Tacit Dimension*. Chicago: University of Chicago Press.
- Polanyi, M. (1998). *Personal Knowledge: Towards a Post-critical Philosophy*. London: Routledge.
- Popp, A. (2015). *Entrepreneurial Families: Business, Marriage and Life in the Early Nineteenth-Century*. London: Routledge.
- Raffaelli, T. (2003). *Marshall's Evolutionary Economics*. London: Routledge.
- Reed, R., & De Fillippi, R. J. (1990). "Causal Ambiguity, Barriers to Imitation, and Sustainable Competitive Advantage". *The Academy of Management Review*, Vol. 15, No. 1, pp. 88-102.
- Ricciardi, A., & Izzo, F. (2006). *Relazioni di Cooperazione e Reti di Imprese: Il Caso della Campania*. Milan: FrancoAngeli.
- Robertson, P. L., Jacobson, D., & Langlois, R. N. (2008). "Innovation Processes and Industrial Districts". *DCU Business School Research Paper Series*, No. 44, pp. 1-29.
- Rogers, E. (1982). "Information Exchange and Technological Innovation". In D. Sahal, *The Transfer and Utilization of Technical Knowledge* (pp. 105-123). New York: Lexington Books.

- Roos, J., & Von Krogh, G. (2016). *Organizational Epistemology*. New York: Springer Publishing.
- Rosenberg, N. (2008). *Inside the Black Box: Technology and Economics*. Cambridge: Cambridge University Press.
- Ruggiero, A. (2005). "Paul Krugman and the New Economic Geography-Assesment in the Light of the Dynamics of a "Real World" Local System of Firms". ERSA 2005-45th Congress of the European Regional Science Association, Amsterdam, 2005: Conference Paper.
- Rullani, E. (1995). "La Politica del Postfordismo: Un'Agenda per la Sinistra". *Il Ponte*, Vol. 51, No. 4, pp. 3-28.
- Rullani, E. (1997). "L'evoluzione dei Distretti Industriali: Un Percorso tra Decostruzione e Internazionalizzazione". In V. Riccardo, & F. Luca, *Il Distretto Industriale tra Logiche di Impresa e Logiche di Sistema*. Milan: FrancoAngeli.
- Rullani, E. (2003). "The Industrial District (ID) as a Cognitive System". In F. Belussi, G. Gottardi, & E. Rullani, *The Technological Evolution of Industrial Districts. Economics of Science, Technology and Innovation, Vol. 29* (pp. 63-88). New York: Springer.
- Rullani, E. (2003). "I Distretti Industriali al Tempo dell'Economia Globale". *Impresa e Stato*, No. 63/64, pp. 80-83.
- Rullani, E. (2004). *Economia della Conoscenza. Creatività e Valore nel Capitalismo delle Reti*. Rome: Carocci Editore.
- Russo, M., & Natali, A. (2008). *Sebastiano Brusco e la Scuola Italiana di Sviluppo Locale*. Modena: University of Modena and Reggio Emilia, Department of Political Economy.

- Saltini, E. (2017, May 22nd). *La Valorizzazione dei Talenti in 5 Grandi Aziende*. Retrieved from italymanager.com: <https://italymanager.com/la-valorizzazione-dei-talenti/>.
- Savi, K. (2020, February 5th). "Interview to the Education Area Coordinator of Certottica". (L. Marcon, Interviewer).
- Schilirò, D. (2008). *I Distretti Industriali in Italia quale Modello di Sviluppo Locale: Aspetti Evolutivi, Potenzialità e Criticità*. Milan: Vita e Pensiero.
- Seaton, R., & Cordey-Hayes, M. (1993). "The Development and Application of Interactive Models of Industrial Technology Transfer". *Technovation*, Vol. 13, No. 1, pp. 43-53.
- Sforzi, F. (2008). "Il Distretto Industriale: Da Marshall a Becattini". *Pensiero Economico Italiano*, Vol. 16, No. 2, pp. 71-80.
- Sharadar. (2016, December 31st). *Luxottica Group S.p.A*. Retrieved from fairlyvalued.com: <https://fairlyvalued.com/company/LUX>.
- Sloman, S., & Fernbach, P. (2018). *The Knowledge Illusion: Why We Never Think Alone*. New York: Riverhead Books.
- Spencer, H. (1862). *First Principles*. New York: D. Appleton & Company.
- Spender, J.-C. (1996). "Making Knowledge the Basis of a Dynamic Theory of the Firm". *Strategic Management Journal*, Vol. 17, No. 2, pp. 45-62.
- Spex Magazine. (2017, October 20th). *Certottica*. Retrieved from spexmagazine.com: <http://spexmagazine.com/en/certottica-2/>.

- Sreckovic, M., & Windsperger, J. (2011, October 19th). "Organization of Knowledge Transfer in Clusters: A Knowledge-Based View". *New Developments in the Theory of Networks*, pp. 299-315.
- Stiglitz, J.E., & Greenwald, B. C. (2014). *Creating a Learning Society: A New Approach to Growth, Development, and Social Progress*. Columbia: Columbia University Press.
- Tan, H. (2020, March 20th). *There Will Be a 'Massive' Shuffling of Supply Chains Globally After Coronavirus Shutdowns*. Retrieved from [cnbc.com: https://www.cnbc.com/2020/03/20/coronavirus-shocks-will-lead-to-massive-global-supply-chain-shuffle.html](https://www.cnbc.com/2020/03/20/coronavirus-shocks-will-lead-to-massive-global-supply-chain-shuffle.html).
- Tappi, D. (2001, January 1st). *The Neo-Marshallian Industrial District. A study on Italian Contributions to Theory and Evidence*. Retrieved from [researchgate.net: https://www.researchgate.net/publication/228536593_The_Neo-Marshallian_Industrial_District_A_Study_on_Italian_Contributions_to_Theory_and_Evidence](https://www.researchgate.net/publication/228536593_The_Neo-Marshallian_Industrial_District_A_Study_on_Italian_Contributions_to_Theory_and_Evidence).
- Taylor, W. C. (1842). *Notes of a Tour in the Manufacturing Districts of Lancashire: In a Series of Letters to his Grace the Archbishop of Dublin*. London: Duncan & Malcolm.
- Teece, D. J. (1986). "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy". *Research Policy*, Vol. 15, No. 6, pp. 285-305.
- Testa, G. (2012). *Il Distretto Petrolifero: Struttura e Funzionamento. Il Caso della Val d'Agri*. Milan: FrancoAngeli.
- The New York Times. (2020, July 15th). *Coronavirus Map: Tracking the Global Outbreak*. Retrieved from [nytimes.com: https://www.nytimes.com/interactive/2020/world/coronavirus-maps.html](https://www.nytimes.com/interactive/2020/world/coronavirus-maps.html).

- Torrise, S. (2002). *Imprenditorialità e Distretti ad Alta Tecnologia: Teoria ed Evidenza Empirica*. Milan: FrancoAngeli.
- Triglia, C. (1992). "Italian Industrial Districts: Neither Myth nor Interlude". In F. Pyke, & W. Sengenberger, *Industrial Districts and Local Economic Regeneration* (pp. 33-47). Geneva: International Institute for Labour Studies.
- UNCTAD. (2020, March 4th). "Global Trade Impact of the Coronavirus (Covid-19) Epidemic". *Trade and Development Report*.
<https://unctad.org/en/PublicationsLibrary/ditcinf2020d1.pdf?user=1653>.
- Vaccaro, I. G., Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2012). "Management Innovation and Leadership: The Moderating Role of Organizational Size". *Journal of Management Studies*, Vol. 49, No. 1, pp. 28-51.
- Vietina, S. (2019, September 9th). *Occhiale, il Distretto Bellunese Scommette sul Politecnico*. Retrieved from corrierealpi.gelocal.it:
<https://corrierealpi.gelocal.it/belluno/cronaca/2019/09/08/news/occhiale-il-distretto-bellunese-scommette-sul-politecnico-1.37430452>.
- Voltan. (2020, February 15th). *Our History*. Retrieved from voltan1898.com:
<https://voltan1898.com/en/our-history/>.
- Von Hippel, E. (1987). "Cooperation between Rivals: Informal Know-How Trading". *Research Policy*, Vol. 16, No. 6, pp. 291-302.
- Wathne, K., Roos, J., & Von Krogh, G. (1996). "Towards a Theory of Knowledge Transfer in a Cooperative Context". In G. V. Krogh, & J. Roos, *Managing Knowledge: Perspectives on Cooperation and Competition* (pp. 55-81). London: SAGE Publishing.
- Whitaker, J. K. (1975, June). "The Early Economic Writings of Alfred Marshall, 1867-1890". *The Economic Journal*, Vol. 86, No. 342, pp. 367-369.

- Williamson, O. E. (1971). "The Vertical Integration of Production: Market Failure Considerations". *The American Economic Review*, Vol. 61, No. 2, pp. 112-123.
- Wilson, J. F., & Popp, A. (2003). *Industrial Clusters and Regional Business Networks in England, 1750-1970*. Burlington: Ashgate Publishing.
- Wong, Y. Y., Maher, T. E., Nicholson, J. D., & Bai, A. F. (2003). "Organisational learning and the risks of technology transfers in China". *Management Research News*, Vol. 26, No. 12, pp. 1-11.
- Wood, J. C. (1993). *Adam Smith: Critical Assessment*. London: Routledge.
- Yan, Y. (2014). *"The Development of Absorptive Capacity in Large Firm-A Longitudinal Exploratory Study on Garmin's Automotive/Mobile Segment Over Time Span"*. Bachelor's Thesis, University of Twente.
- Zahra, S. A., & George, G. (2002). "Absorptive Capacity: A Review, Reconceptualization, and Extension". *The Academy of Management Review*, Vol. 27, No. 2, pp. 185-203.
- Zaratiegui, J. M. (2004). "Marshallian Industrial Districts Revisited. Part II". *Problems and Perspectives in Management*, Vol. 2, No. 3, pp. 43-58.