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Thesis report

Evolutionary cycles and dimensions of change

A longitudinal and extensive study of Castel Goffredo industrial district

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1. Introduction and questions

The study of industrial clusters and economic agglomerations is a topic that has been enthralling, since decades, scholars, researchers and policy makers from different backgrounds. Being the study of the economic landscapes de facto at a crossroad between various disciplines, many were, in the years, the works attempting to give explanations and insights in regard of the phenomenon of industrial clustering, starting from different assumptions and perspectives. However, although industrial clusters have been widely studied due to their potential and effects for firms and regional economies, mechanisms at the base of their birth, development and eventual decline remained widely neglected by scholars for a considerable amount of time. In this regard, in recent years, new paradigms and approaches to economic geography were developed purposively to cope with such issues, one of them being Evolutionary Economic Geography (EEG).

Differently from previous paradigms, the one of EEG was conceived in order to take into account -more seriously- history (processes), geography (place-specific factors) and other factors, previously largely neglected, in the study of economic landscapes and their technological evolution (Boschma and Martin, 2010; Hassink, 2010). Thus, by understanding how such dimensions effectively play a crucial role in influencing the unevenness of economic landscapes, EEG also attempts their operationalization. In such regards, regional economies and industrial clusters are themselves interpreted as historical processes, and, rather than flows of capital, the paradigm considers knowledge diffusion, technological innovation and adaptation of systems as main drivers of development in space (Boschma and Frenken, 2006). In short, history matters in EEG's framework, since the current (and future) state of affairs of the geographical/economic systems is not explained through a mere tendency of the latters toward equilibrium, but as a rather complex and quasi-irreversible process that unfolds over time. In addition to use evolutionary economics as base for its theoretical framework, the paradigm developed around the main concepts of Generalized Darwinism, Path-Dependence and Complexity Theory (Boschma and Martin, 2010), and, in turn, produced several others appealing notions for the study and analysis of industrial clusters and agglomerations. This said, however, EEG is still a paradigm that, due to its newness, but also nature of the approach itself, remains open to refinements and necessitates further research in order to build a more coherent and solid body of knowledge.

Conceived in close relation with EEG's derived notions of path-dependence, lock-in, path creation and learning region, is the concept of "cluster life cycle". This concept has been recently developed by scholars, and has been an object of study for reasons of both academic and policy-oriented nature. At the base of a life-cycle conceptual framework is the

assumption that, during their historical development, industrial clusters and economic regions evolve by following a precise sequence of stages, recognizable by different stylized facts and rationales and features (Maskell and Kebir, 2005; Bergman, 2008; Menzel and Fornahl, 2009; Ter Wal and Boschma, 2009; Hassink, 2010b). In this sense, the approach, in addition to focus on how clusters function, investigates on the reasons which bring the latters to become what they are from their rise till their decline. The stylized model affirms that after a phase of emergence/birth clusters enter in a growth phase, often followed by a period of sustainment and eventual decline in respect of its sector of production. Following this, it has been observed, in several cases, that the motivations and factors contributing to clusters' success, in a first moment, are also those often turn into stubborn obstacles in later stages (Maskell and Malmberg, 2007). However, despite being related, the life cycle of a determinate cluster might differ significantly from that of its product or industry. In effect, cluster and regions have the possibility to renew themselves, during their history and development, changing radically their entity in the process, in case of necessity. Precisely, main claim of the life-cycle theorists is that, in addition to upgrade and specialize, economic landscapes should be able to maintain (or create) a certain degree of heterogeneity within their activities. What clusters should seek is, in effect, an increasing fitness and adaptability in face of external shocks, apt to escape deleterious situations of saturation and avoid the sort of "ageing process" eventually occurring through time. At the same time, however, recent studies on clusters' evolution, based on case studies, and enriched with new insights concerning the non-equilibrist conception of path-dependence and recently developed notion of "resilience" (Martin, 2010), have evidenced other aspects of the evolutionary cycle. More precisely, it was introduced and discussed the framework of adaptive cycle of clusters, in relation to the new notions of resilience and panarchy, applied to the context of geographical economic systems (Pendall et al., 2009; Simmie and Martin, 2010; Martin and Sunley, 2011). From such perspective, is the assumption that industrial clusters and economic regions resemble to ecological complex adaptive systems, thus, path-dependent entities, constantly in a ferment caused by the continuous influence of both endogenous and exogenous factors. As such, it was observed that cluster, due to their openness and complexity, could effectively exhibit, in reality, development trajectories decisively more different and unpredictable in respect to those esteemed by life-cycle frameworks. Adaptive cycle essentially introduced and focused on two new interlinked theoretical notions: first, the one of non-equilibrist path-dependence of a geographical economic system; second, the changing dimension of resilience, crucial for both the resistance and adaptability of the economic system itself and also alleged to change depending from many factors (as, for example, the variety in the industrial theme and the ageing process of clusters).

Overall, studies based on the evolutionary cycle of industrial clusters certainly appear as appealing concepts, since able to consider the development of economic landscapes either in detail and wholeness at the same time. Thus, implications of the research are not solely oriented to academic or theoretical scopes but might also be of particular relevance in the context of clusters' policies. For example, understanding that the process of clusters' evolution is essentially a coming after another of different stages of development – thus, presenting particular regularities -, recommends different interpretations of the situation and adapting policies for each stage. In addition, following the perspective furnished by such studies, the reason why some regions or clusters succeed, or fail, is not solely conducted to an output of chance, of external shocks or of the current state of affairs, but as a rather continued and quasi-irreversible evolutionary process (Martin and Sunley, 2006; Malmberg and Maskell, 2010). In line with EEG's tradition, it is assumed, from a cluster cycle's perspective, that different histories and past events are likely to condition strongly the development of economic landscapes, in particular by influencing the extent to which these latters remain fit and adaptable. However, such strand of studies, belonging to the larger umbrella of EEG, still needs further clarifications. Notably, Boschma and Fornhal (2011) have outlined a roadmap for the research in this topic. Firstly, little information is available from field research. In effect, given the relatively recent conceptualization of such notions, few case-studies from the "real-words" have been analysed by employing longitudinally and extensively cluster cycle theories as a frame of analysis (examples of such studies were: Hassink, 2007; Simmie and Martin, 2010; and Shin and Hassink, 2011), consequently, further insights are required to test the validity of such cycle-frameworks tout court (Menzel and Fornahl, 2009). Secondly, additional light should be shed on the theoretical debate around evolutionary cycles, which, although similar, express slightly different manners of analysing and interpreting the development of clusters. In particular, it is unclear whether if a straight division in evolutionary stages of development, reflects the effective process of cluster evolution. Clusters are, in effect, open and complex entities on which any kind of classification or fixed framework might result difficult (Martin and Sunley, 2011). In this regard, following Boschma and Fornahl (2011) additional empirics should focus on the opportunities represented by a combination of different approaches. Thirdly, further research is needed aimed to emphasise the leverage of such conceptual frameworks for what concerns the opening of new perspectives of research and their eventual use for policies or decision-making. An in-depth clusters' study based on an historical and evolutionary analysis should consider, in fact, the various "dimensions of change"of a determinate geographical economic system: such as heterogeneity, connectivity and the recently introduced concept of resilience (Menzel and Fornahl, 2009; Simmie and Martin, 2010) , possibly giving insights that would be otherwise difficultly evidenced by using other approaches of more mainstream nature.

In sum, the literature on industrial clusters' evolution is still in a blatant need of further research - especially based on concrete cases - apt to confirm or refine what has already been discussed by scholars about the cycle of clusters(Boschma and Fornahl, 2011). The hosieries' industrial district of Castel Goffredo, in such instance, is presented as a suitable case on which to conduct a research of this kind. The cluster is one of the many economic realities in the Italian context, in which, in previous decades, it was witnessed a development mainly characterized by the fast emergence and growth of a peripheral industrial agglomeration, based on small and medium enterprises and specialized in manufacture. In recent years (prominently, after 2000) it was observed, how, many Italian industrial districts (IDs) have effectively undergone fundamental changes by modifying their morphological assets (Rabellotti et al., 2009; Randelli and Boschma, 2012). This especially in reply to the new challenges represented by globalization, change of consumes and various kinds of macro-economic shifts. The district of Castel Goffredo was not an exception in this regard, however, despite having undertaken various reorganisations and verticalizations of the production system and implemented technological improvements, the cluster was not able to escape a crisis of the industrial sector, which in recent decades affected especially the levels of employment in the region.

The purpose of the present dissertation was, therefore, to perform an historical analysis on the district of Castel Goffredo by employing and combining the tools of analysis and insights furnished by EEG and clusters' cycles (especially life, adaptive and triggering factors). In so doing, the two major aims of the current study are, respectively: to enrich the literature about such recently developed conceptual frameworks, and to attempt a different analysis, from an historical perspective, of the causes and processes, which brought the district in the nowadays situation of continuous decline. Here, we want to suggest that cluster-cycles are certainly promising concepts for the research in economic geography, cluster studies and policy-making. However, we will also emphasize that the complex nature and development of entities like clusters suggest a more careful applications of such concepts and their derived insights.

1.1 Research questions

1) What kind of cluster cycle for Castel Goffredo?

As already mentioned in the introduction, the main purpose of our research is essentially to grow the literature of EEG and, in particular, cluster cycles by applying such notions - which, till now, have been dealt mainly theoretically- to a case study selected. An in-depth historical

analysis having as main subject the hosiery district of Castel Goffredo permits to trace the path followed by the cluster through its various phases of development. Accordingly, considering the sequence obtained, it is possible to make some considerations about the particularities of the case in question, which might be compared with stylized facts and insights furnished by cluster theories on clusters' cycle. Therefore we reply to this first main question of research by articulating it into four sub-questions:

a) Which periods are identifiable and correspondent to which stages of development?

To start with, answering to this first sub-question consists in a broad analysis of the evolutionary cycle of the cluster. By using different methodologies of research, we attempt divide the history of district's in distinct historical periods, eventually corresponding to the evolutionary stages of cluster's development. Following the literature on the topic, several are the factors and stylized facts helping in the recognition of such phases (Bergman, 2008). In the present work, however, we will mainly rely on the results obtained in our field research, thus through the analysis of historical reports, the study of firms' population and grounded theory (interview and focus groups). The aim is to detect the triggering factors, periods of turbulence, location of start-ups and system's rationales, which might effectively help to trace the sequenced evolutionary cycle of cluster's development(Bellussi and Sedita, 2009; Menzel and Fornhal, 2009; Ter Wal and Boschma, 2009; Shin and Hassink, 2011; Elola et al., 2012). The analysis of district's evolution through the succession of stages and consequent identification of clusters' cycle is "the core" of our research, since it effectively permits to answer to further questions.

b) Are the phases of the cycle neatly distinguishable?

Responding to this second sub-question should lead to an improved understanding and interpretation of the dynamics of cluster cycle. Considering the analysis of different stages, we are interested in understanding whether if the phenomenon of district's development is neatly separable in evident and peculiar stages (Maskell and Kebir, 2005; Menzel and Fornahl, 2009) or if it is, rather, a complex process, which sees the "blurred" coming of one after another of periods presenting, de facto, mixed characteristics. In other words, our claim here is that some of the factors and processes conditioning the development of economic landscapes might, in effect, transcend such stylized conception of development in different stages, presenting instead a more continuative and complex trend (this in line with the insights brought by Martin and Sunley, 2011). The answer to this question serves mainly as a reinforcement for frameworks' theoretical bases, given the lack of empirical work about evolutionary cycles. However, the result also has implications for what concerns the realm of

clusters' policies, since it discusses the explanatory leverage and validity of such recently conceived concepts and their eventual practical application in processes of decision-making.

c) Is it possible to recognize any real phase or sign of equilibrium?

This sub-question is, to a large extent, strongly related to the previous one. In the light of recent insights -and critiques- that have been put forward to the study of industrial clusters, our analysis of Castel Gofferdo's district cycle should fit in the wider debate around the academic and theoretical conception of EEG. Precisely, scholars have recently advanced the claim that - as complex systems – economic landscapes should not be meant as entities pointing toward a proper equilibrium (an assumption which is instead at the base of the majority of mainstream approaches) (Martin, 2010; Martin and Sunley, 2010, Simmie and martin, 2010). Thus, in the present work, by considering the results of our analysis, we try to detect, in the history of the cluster, the eventual presence of periods (or situations), which, due to their characteristics, tend to describe a pattern similar to stasis, sustainment, stagnation or, more in general, equilibrium of the assets.

d) Life or adaptive cycle?

This last sub-question completes the first main question of this report and is also of an essential academic nature. Considering the two main conceptual frameworks recently developed by scholars for the investigation on clusters' cycle, thus: life and adaptive cycle, our interest is about discovering which one of these two approaches fits better with the analysis of our case study. Thus, also the answer to this sub-question is obtained by confronting the findings of our research with previous studies of more theoretical nature. In effect, although basically similar, the two approaches differ especially in the way they deal with the issue of complexity. In this sense, while life-cycle tend to give an essentially more linear interpretation of clusters' evolution, adaptive cycle emphasises the unpredictability and specificity of developmental trajectories, hence suggesting a more in-depth and critique analysis depending from the peculiarities of the case study in question (see respectively Menzel and Fornhal, 2009; Martin and Sunley, 2011). Due to the complexity and openness of geographical economic systems, we state beforehand that our purpose is not to confirm the absolute validity of one approach in respect of another, nor we seek to suggest an "optimum" framework for cluster cycle analysis. The aim is, more generally, to give our contributions to the recent debate around clusters' cycle and further enrich EEG's literature and create a sort of "theoretical bridge" between the approaches.

Moving on, still considering the insights of EEG and, in particular, pioneering researches on clusters' cycle, one of their main contributions probably consists in having operationalized

the notion of history within the framework of regional analysis. Thus, it is affirmed by such studies that, besides being essentially non-equilibrist and dynamic, the nature of complex entities - like clusters – is likely to be strongly influenced by the particular events and historical process which, in effect, determined their existence. The second main question of this research therefore is:

2) How could an historical and cycle-oriented analysis give additional insights on the motivations causing the decline of the district?

By answering this question our main concern is to give a different perspective about the causes that brought the district toward its crisis, this by considering the latter as the consequences of a rather rooted and continuative process, instead of mere shocks to a current state of affairs. Precisely, we want prove whether the study of history and geographical context matters, when it comes to the analysis of Castel Gofferdo's district development. Differently from the previous main question - which denotes a more theoretical and academic aim -, answering the present one also implies to discuss more in deep the explanatory power derived by the application of such theoretical frameworks and derived concepts. Precisely, by using a heterodox approach, we want to analyse the case study of our research from an alternative perspective and eventually give concrete hints about the well-known problems afflicting the district in recent decades.

First, through an analysis and interpretation of the various dimensions of change its possible to make considerations about the path of development and trajectory followed by the cluster. Thus, permitting an in-depth investigation of the factors bringing to the crisis from a considerably dynamic and specific perspective. Second, by reviewing the developmental history of the district, we look for the presence of eventual "lock-ins": thus, negative continuative processes, which might have emerged in time and hindered the effective fitness of the district and region as economic systems.

a) Is there a "decline before decline" considering various dimensions of change?

From the limited, yet seized, literature on clusters' cycle it understood that the coming of one after another of various development phases in economic systems is often accompanied by an effective related variation in what might be called their historical dimensions of change. Besides being recognizable from particular patterns and characteristics, different stages of cluster development tend, in fact, to exhibit varying levels of: heterogeneity for what concerns know-how and diversification of firms' activities (); interactions and interdependencies between actors involved (); and, consequently, overall resilience of the system in face of shocks, recessions and eventual crises (Martin, 2012; Boschma, 2014).

Thus, these dimensions tend to change depending from the inherent and contingent conditions of a determinate economic landscape, influencing - and being influenced - at the same time by its evolutionary cycle. Precisely, conceptual literature tends to associate each stage of cluster evolution with varying levels in its endogenous dimensions of change of heterogeneity, connectivity and resilience (Menzel and Fornahl, 2009; Martin and Sunley, 2011). Following such theories, the decline of clusters often begins far anteriorly compared to their full-blown crisis. On the one hand, when replying to the above sub-question, we want to make use of previously explained insights in order to shed new light on the factors responsible of districts' decline. On the other hand, this task is also an occasion to discuss the theoretical bases of changing dimensions themselves and their relation with the notion of cluster evolutionary cycle.

b) Is the decline eventually caused by lock-in dynamics?

Through an in-depth historical analysis it is also possible to investigate whether if the cluster has ever fallen into some sort of permanent negative and stagnant status, which, following EEG's literature, could be eventually identified as a situation of lock-in in decline. The notion of lock-in is one of the main hints of EEG (Grabher, 1993; Martin and Sunley, 2006; Hassink, 2005; Hassink, 2010a). Differently from the majority of clusters' theories, which mainly tend to discuss the general advantages brought by the clustering of activities, this concept is one of the few discussing the possible dangers and shortcomings of such phenomenon (Hassink, 2007). Situations of lock-in in industrial clusters might be of different type depending from the factors and events that eventually trigger them. Most commonly, the diffused choosing and the consequent narrowing down on a certain technological trajectory and industrial sector is one of the major causes of (functional/cognitive) lock-in in an economic landscape. However, also institutions and power relations present on the territory should not be underestimated, since they might also lead to complex and intricate situations of immobility (political lock-ins), from which clusters can hardly escape. It is alleged, in particular, that the choosing of particular triggering factors or strategies throughout the process of clusters' evolution might condition significantly the fitness of these latters in a future (Bellussi and Sedita, 2009). With this premises, given the blatant crisis affecting the district object of our studies in recent decades, we are interested about understanding whether this decline is to be linked with a situation of lock-in emerged in the past.

1.2 Research structure

Laying the purpose and aim of research *chapter 1* was an introduction to the problem field by exposing the main questions of this research. To start with, *chapter 2* deals with previous studies conducted on agglomeration economies and industrial clusters. This session, besides giving a brief review of the previous literatures on the topic, spends some important words in describing the problems and limitations typical these latters. In particular, we discuss about the difficult implementation and operationalization of the concept of history in the majority of the theoretical frameworks of industrial clusters' analysis. As a continuation, *chapter 3*discusses the different perspectives and opportunities offered by the recently developed of Evolutionary Economic Geography. The same chapter also introduces and explains the different evolutionary concepts of cluster cycle, which are also the main subject of our research. In so doing we place emphasis on on the essentially historical nature of such frameworks. *Chapter 4*is the session in which it is presented the case study object of our work: the industrial district of Castel Goffredo, this along with the methodology used for its historical investigation. *Chapter 5* is consequently the core of our report. This chapter outlines the main findings of the research and analyses them. Precisely, the chapter deals with the historical analysis of the district by detecting different historical periods of development, in their turn ascribable to different evolutionary stages and characterized by varying dimensions of change. This dissertation ends in *Chapter 6*, in which an answer is given to the research questions and, by considering the findings, some considerations are made about the relevance, limitations and new horizons for further contributions.

2. Previous research on clusters: non-historical perspectives?

The question of why economical activities generally tend to cluster in space is a topic long debated by scholars. In fact, considering both past and recent decades, organization and firms within the same commercial/industry theme are often seen clustering, regardless the improvement in communication and transportation technology – which are supposed to lead to a dispersion of economic activities in space. These clusters are different in their nature, and could emerge as industrial parks or districts with a various range of activities taking place in different spatial centres. Often, the formation of a cluster might take form in an already existent settlement - even a big city or a small town - or in an area which witnesses the specialization of different local enterprises in a particular industrial theme or strand (Gabaix, 1997, McCann, 2008). What became evident to the eyes of researchers was that firms tended to proliferate in relatively circumscribed areas, despite associated costs of inflation and congestion. Thus, what challenged (and still challenges nowadays) scientists was to give a valid explanation of the processes and dynamics regulating such phenomena. Many factors were alleged potential causes for the development of industrial clusters: some of analytical, some of technological, some of institutional nature, thus permitting several different disciplines to enter the debate on this topic.As such, especially in recent decades, scholars from various fields of research – namely, economics, geography, sociology, politics and others - attempted to explain the reasons and the dynamics responsible of formation and development of industrial clusters. In so doing, they often started from arguably different background studies and theoretical premises. Thus, if, on the one hand, clusters might certainly be considered as interesting topics of potential convergence between different subjects, on the other hand, it could be stated that the overlapping of different approaches generated a certain amount of turmoil, especially for what concerns analytical and epistemological foundations of cluster theories (McCann, 2001). Moreover, it might also be observed how the study of clusters and - economic geography in general -became often plead for clash between different disciplines, rather than an occasion for a real dialogue between researchers of different economical or institutional "creeds" [1] . Nevertheless, these controversies did not stop the concept of industrial cluster from becoming a major topic in many social sciences researches agenda.The study of industrial agglomerations gained particular prestige in the Italian environment, where the economy developed in line with the emergence of a constellation of industrial clusters later called "Industrial Districts" (IDs)

[1] As we will see, it is possible to observe how economic and institutional strands have for a long time developed next to eachother in a so called "dialogue of the deaf" (Boschma and Frenken, 2006).

which spread across the country. Theories on agglomerations and clusters' development have been taken in great consideration, by both academic and administrative sectors, to explain the complex socio-economic embeddedness of Small Medium Enterprises and their territory (Cainelli, 2008). Because of their particularity, Italian IDs became ideal "study grounds" for scholars from different fields of research. However, notwithstanding the great progresses obtained by scholars in explaining the nature of clusters (and therefore IDs) and their potential for economic growth, we will evidence how little attention was paid, until recent years, to the processes responsible of creation and development of clusters themselves. More precisely, we will make clear how, previous research, tended to consider industrial clusters more from a static historical point of view rather than from a dynamical one.For this purpose, in this session we will review briefly previous studies on industrial clusters development with an emphasis on the differences between the solutions given by the two approaches of New Economic Geography and Institutional Economic Geography. Hence, we will also discuss how economic geography and other subjects dealt with the peculiarity of Italian Industrial Districts in terms of sometimes more economical and sometimes more institutional perspective.Finally, following the relatively recent article of Garretsen and Martin (2010) we will conclude evidencing the limits,which were encountered by both the approaches when challenged to give clear answer to the development of clusters (especially concerning their origins and development). Thus, we call for the need of a more historical and dynamic approaches able to perceive clusters (Hence, IDs) not only as mere contingent economic agglomerations, but,rather, as real historical constructs. These premises are necessary for the introduction of the Evolutionary Economic Geography approach in the next chapter.

2.1 Agglomerations, clusters, milieux

Industrial Agglomerations and geographical economics.(NEG)

Even though agglomeration economics and studies about industrial clustering mainly have emerged as a central interest of scholars in the last two decades, their study dates to the previous century starting with explanations deriving mainly from the realm of neoclassical economics. Economics approaches to economic geography are based on the typical assumptions of utility maximization, representative rational agents and equilibrium analysis.

The first scholar who dealt with the concept of agglomeration economies, and therefore prepared the fertile ground for various subsequent studies, was Alfred Marshall (1922). Marshall attempted to give an explanation to the phenomenon of industrial clusters' formation by using the concept of "external economies", which were presented as economies

independent from a single firm, but develop thanks to the synergy with all the firms located in the same area[2]. In addition, after having studied the characteristics of British industry in the 19TH century, the scholar concluded that, besides the benefits given by lower transport costs and economies of scale, there were also other reasons which leaded firms and activities to polarize in order to gain a competitive advantage. Firstly, he recognized that a more circumscribed spatial area was likely to favour the flow of knowledge in general. On the one hand, allowing a more frequent face-to-face contact for the exchange of tacit knowledge, and, on the other hand, making the so called "spillovers" of knowledge easier to grasp by the surrounding community of related firms. Secondly he described, as one of the main agglomerations' advantages, the creation of a so called "industrial atmosphere" in which workers could develop a sort of diffused plethora of competences and skills. Thus, benefitting the overall local specialized labor pool by making hiring research-costs lower, and highly flexible. Finally, Marshall underpinned that the potential for innovation is likely to be higher in areas of agglomerations of relatively small firms than in big hierarchic enterprises, claiming that, despite the lower availability of resources, a multitude of different organizations can better receive ideas from new patents. The study of Marshall remained for many years the principal explanation to the development of industrial clusters. The analysis of clustered firms with the use of concepts of spatial economics was undertaken by many scholars after Marshall (Olin, 1933; Hoover, 1948; Isard and Kuenne, 1953; Asheim, 1996), however, the static analytical nature of first regional models and their essential non consideration of geography, replaced only by the concept of competitive markets, already represents a sort of limitation (McCann, 2001).

More recent insights drawing from the field of business studies also made their contribution to the explanation of agglomeration economies (Scott, 1988; Porter, 1990, 1998) [3] reconfiguring industrial clusters into a more spatial context through the use of non-technical and more inductive and descriptive approaches (McCann, 2008). Yet, the real operationalization of the agglomerations economies' concept must probably be recognized in the work of Krugman (1995) with the creation of the so called New Economic Geography (NEG), which became later the general core model for many other approaches based on geographical economics (Fujita et al., 1999; Brakman et ali, 2001; Duranton and Puga, 2000; Baldwin et ali, 2003).Krugman, starting from the study of the "new trade model" (Krugman, 1980) derived by Ohlin-Hoover theories (McCann, 2008), attempted to build a more analytical and comprehensive framework of analysis, in order to give an exhaustive reply to the question of uneven social development. In doing so, he developed a model based on

[2] Precisely, Marshall makes a distinction between external economies of scale and economies of agglomeration.
[3]In this regard it must be recognized that the appellativeitself of "industrial cluster" was first introduced by the work of Porter (1990).

increasing returns (Arthur, 1994), imperfect competition (Dixit and Stiglitz, 1977) and transport costs (Samuelson, 1952, McCann, 2005), which was able to explain the formation of agglomerations without having to assume regional differences or external economies (Boschma and Frenken, 2004)[4]. Consequently, following what was later called the "Core-Periphery model", the emergence of industrial clusters, would have essentially be provoked by the struggle between agglomeration forces (like market and location size effects, lower costs of living and transport) and spreading forces (like competitive effects or costs of congestion) (Krugman, 1995; Fujita and Thisse, 2008; Garretsen and Martin, 2010). Later, the model of Krugman, which was formerly conceived only for a in a dual region perspective, was re-implemented for models aimed to perform a more multi-region analysis (Fujita and Krugman, 2004; Fujita and Mori, 2005), yet, still struggling with a complete inclusion of different territorial actors at the same time (Behrens and Nicoud, 2009).

This discussed, it must be stated that theories of NEG proven to have their pros and cons. On the one hand, the work of Krugman contributed to give a decisively more concrete and generalizable explanation to the phenomenon of economic/industrial clustering. Thus, differently from more "geographical" approaches –based mainly on case studies-, NEG models offered a more testable and rigorous method of research ranging from micro to macro scale (Overman, 2004). On the other hand, as argued by many scholars (Martin, 1999; Sugden, 2000; Amin and Thrift, 2000; Corpataux and Crevoisier, 2007) the inclination of NEG to use primary (if not solely) formal models, led the approach to a progressive detachment from the subject of real geography. In effect, NEG was argued to suffer from a lack of empirical validation by in practice "taking for granted what has to be explained" (Garretsen and Martin, 2010).

Innovative milieux, favorable environment and Institutional approaches (IEG)

First applications of concepts such as culture, social environment and influence of local commutnities to the context of economic geography were conducted by Weber (1920) who stressed that an economic area was not only subjected to the kind of industry but also to socio-cultural peculiarities of local communities and institutions (Trigilia, 1994). Afterward, thanks also to the contributions of Marxist geography (Harvey, 1985). Starting from the 90', and following the so called "cultural turn" (Amin and Thrift, 2000; Barnes, 2001; Gertler, 2004), a considerable number of studies began to take into more consideration the so called

[4] It could be observed how, in NEG, the space which characterizes the regions in questions is substantially neutral and Euclidean, in the sense it matters only for what concerns the transport costs (Boschma and Frenken, 2004). The regions in question are assumed to be equal endogenously and are basically conceived "as just two points at the opposite ends of a straight line" (Garretsen and Martin, 2010).

"real world" and the presence of an important external environment able to influence economic performance of regions – clusters included. Thus, in few years –and almost contemporary with NEG- it became clear the emergence of anotherparadigm based on the (socio-cultural) Institutional approach to Economic Geography (IEG) (Martin, 2000).

From its very early stages, however, it became clear that IEG was a constructivist paradigm, hence not really characterized by precise theoretical foundations and methodological procedures, but, rather, building prominently on a plurality of different case studies and descriptive methodologies. For this reason, institutional economic geographers are, in a way, still struggling to create a more integrated approach for their research. Nevertheless, what could be said, is that their studies have, as a common the premise, the assumption that economic development should be interpreted rather from a macro to micro perspective. This, with a regard to what they consider the peculiar characteristics ofreal places as: capital and previous endowments, socio-cultural spatial patterns, formal and informal institutions,. In this sense, essential difference of IEG with NEG is represented by regarding the actors forming the economic environment as constantly power constrained and rationally bounded instead of "God- like actors" constantly pursuing the best rational utility-maximizing choice (Martin, 1999).

In this vein, the answers given by IEG to the nature of industrial clusters are several and heterogeneous trough time. Concepts widely used, which could be argued be being akin to institutional approaches, are for example the one of "creative milieux" for economic development (Aydalot and Keeble, 1988; Maillat et al., 1997; Saxenian, 1994, Maillat, 1998) or the one consolidated industrial atmosphere able to attract investments from external environment (Scott and Storper, 1989; Amin and Thrift, 1992). According to such theories, the creation of an industrial cluster would shape territory in itself, by creating a particular super structure affecting the behaviour and performance of firms located within the cluster area, thus enhancing competition, cooperation and innovation. An attempt of operationalization of such studies could probably be identified in the work of Porter (1990) about the advantage of cluster's competitive diamond. However, it might be argued that the majority of these studies focused more on understanding the dynamics of success and the potential for business of industrial clusters rather than giving an exhaustive explanation for their existence and uneven emergence in space (Martin and Sunley, 2003). Agglomeration forces like shared trust and knowledge, skilled labour pools and reputation might, in effect ,

play an important role for clusters' wealth, however they do not explain clearly how this very same environments are created.[5]

As said, much of the "canonical" literature on institutional economics focused on macro structures responsible of regional differences, starting from political economics concepts of capital accumulation (Hodgson, 1988: Jessop, 2002; Hudson, 2006; Jones, 2008), cultural labour division (Massey, 1995; Gertler, 1997; Coe et al., 2004) and from the role of institutions as "rules of the game" (North, 1990) and effective moulders of individual habits (Hodgson, 2006; McKinnon, 2009). In such perspective, it basically follows that for institutional economic geographers the presence of a both a favourable economic environment and institutional flexibility and reactivity are crucial for the emergence industry related firms (Martin, 2000). However, it must also be recognized that, despite all the insights brought by IEG to the issue of uneven spatial economic development – and apart from the methodological fragmentation-, few studies from the field have at least attempted to give a clear answer to the phenomenon of activities agglomeration[6]. Studies have demonstrated how the availability of a favourable industrial, technological and institutional environment, within a region, may facilitate but not determine the birth of a new cluster/industry. In fact, it has been observed how, especially during the early stages of a new industry, pioneering firms must literally create their favourable environment, since, most of the times, the "virgin" economic landscape on which they settle lacks the specific competences, facilities, and institutional arrangements needed for a new industry . The economic landscape of regions, starting from their macro-structures- besides being difficult to define in analytical terms and not researchable with a rigorous method (Overman, 2004) - appears not sufficient for giving all the answers about why some regions with almost "analogue or equipotent" characteristics developed instead of others (Boschma, 2009)[7].

2.1.1 General Studies on Italian districts

[5]For example: How could it be explained the fortune of clusters which started from a limited number of firms (often a single one)? First settlers couldn't benefit the effect of agglomeration.

[6]A notable exception is represented by the article of Dicken and Malmberg (2001) who gave insights concerning the location of firms by developing the concept of "Firm-Territory Nexus". The authors stress the processes of inter-intra firms' governance with surrounding environment, including institutions end identify in clusters "the nexus in which industrial and territorial systems amalgamate" (Dicken and Malmberg, 2001). In this regard, however, the article, thought antecedent, could be considered not being part of the official IEG but, rather, as a forerunner of the relatively new "relational" approach to economic geography (Bathelt and Gluckler, 2003) which we will partly discuss in the next sessions of this research.

[7]As we will also discuss more in deep more recent studies about the processes of knowledge diffusion and networks creation have in effect evidenced that it is possible to find crucial differences among the firms ascribed within the same territorial industrial district (Breschi and Lissoni, 2001; Giuliani, 2007; Boschma and Ter Wal, 2007; Morrison, 2008; Morrison and Rabellotti, 2009). Hence, partly diminishing the "exaggerate" initial importance given by some theories to the traditional overarching superstructure of the industrial district (Boschma, 2009).

In previous decades, the case of after-war Italian development aroused particular interest within the academic and alternative-policy debate on industrial clusters. Precisely, both autoctonous and foreing scholars, often from different backgrounds of study, became interested in the investigation on the so called Industrial Districts which displayed uncommon and peculiar characteristics as agglomerations of firms.

The scenario in which Industrial Districts emerged is the one of Third Italy (Bagnasco, 1977), a socio-economical macro-region more or less comprehensive of the regions of north eastern and central Italy. After World War II, the regions of North East Centrum (NEC) -differently from the already advanced regions of North West based on large enterprise – witnessed a particular form of development which saw as protagonists the complexes of Small Medium Enterprises (SMEs). Here, thanks to the economic recovery, constellations of firms arose, gathered on the territory, based on: a marked product specialization and industry theme, low-levels of technology yet high flexibility and expertise, and a particular social-cultural dimension. They were named Industrial Districts, and they accounted, in the subsequent decades, for more than one half of the total manufacturing workforce and almost one third of the entire Italian export (Lazerson and Lorenzoni, 1999). In recent years, mainly by upgrading the quality of their products, IDs were also able to keep track in spite of the competition from developing countries, thus maintaining the competitive edge in many sectors (Cooke and De Laurentis, 2010).

Industrial Districts were seen for long as alternative models of development, at that time opposed to the already well known large, hierarchical and vertically integrated Fordist enterprise (Piore and Sabel, 1984). The distinctiveness of Italian Industrial districts, in addition to their singular methodology of production based on flexible labor division and subcontractors (Piore, 1992), was identified in the clear bondage shared by organizations, firms and employees in connection with the territory in which they were located. As observed by Becattini (1990) and confirmed by Lazerson and Lorenzoni (1999), the actors involved in the formation of Italian industrial districts were in the large majority of cases people born and grown on the very same territory in which their firms were established. Thus, scholars have always been convinced that shared history, culture, and life-conditions of the people forming the IDs, enhanced considerably the degree of homogeneity and social cohesion lacking in the majority of ordinary industrial clusters, where starting entrepreneurs were often from different places and did not share in many cases any real common background[8]. Thus, given their special social dimension, studies about IDs made use of both the previously discussed

[8] Considering, for example, the development of the well-known cluster of Silicon Valley, Hollywood in the US, or the automobile industries agglomerations emerged in the previous century, it is clear that first entrepreneurs were in-fact coming from different places and backgrounds rather than being part of an already existent community (Saxenian, 1994).

economical and institutional approaches, often combining quantitative and qualitative methodologies. However, it could also be observed how studies where more aimed to discover the potential of districts as systems rather than being interested in their aspects of populations of firms.

To begin with, pioneering studies on IDs were first conducted by Beccatini (1979, 1989, 1990, 1998), who combined neoclassical insights from neo-Marshallian agglomeration economies with studies on the social environment. Following Becattini, the Italian industrial district, is defined as a socio-spatial entity characterized by the active participation and cooperation between the population of firms and a community of people, within a precise area. Becattini also claims that the area of the district is likely to be well distinct spatially, environmentally and historically from the others. In order to give valid explanations about IDs dynamics, Becattini re-employed concepts derived from Marshallian theories on external economies. Approaches similar to the one of Becattini were also undertaken by other scholars of the so called "Florentine School" of industrial districts (notably, Dei Ottati, 1987, 1994; Bellandi, 1989; Bianchi, 1989; Brusco, 1990; Pike and Sengenberger, 1990) and all contributed to give the bases for the analysis of IDs meant as local systems (Garofoli, 1991; Paniccia, 2002).

On the one hand, from a more economical perspective, the difference of IDs with traditional production-systems was identified in their particular horizontal structure allowing for a certain degree of cooperation between small-medium enterprises. In this regard, pioneering studies claimed that industrial districts were characterized by a horizontal (but not fiercely competitive) rather than formalized vertical structure of production (Dei Ottati, 1994, Cainelli, 2008). Furthermore it was alleged that IDs could have represented micro models of contestable markets (Becattini, 1990; Best, 1990; Piore, 1990; Paniccia, 2002) in which the price of products was not only decided by market as an external embracing entity but also by the internal dynamics of competition proper of districts. On the other hand, the study on Italian IDs distinguished also for the emphasis placed by scholars on socio-cultural processes influential on the economic landscape from a rather macro level. Some arguments dealt were, for example, the importance of the heritage of the previous working culture for the formation of SMEs (Paci, 1980) or the widely debated favourable and positive "social capital" (Putnam, 1993; Trigilia, 1994; Boschma, 1999)[9], alleged to be crucial not only for the formation of industrial districts, but also for the peculiar development of Third Italy as a whole.

[9] Though there is not universal definition to describe what precisely "social capital" is, the concept refers mainly to the presence of a social environment which might affect (positively or negatively) the outcome of economic development. In previous decades, researchers became interested in giving more precise and quantifiable accounts of social capital. Coleman (1988) shown how the quality of social capital influences the quality of human capital,

Whether or not romanticized, such vision of IDs had to be revisited in recent decades, especially due to the on-going processes of globalization, which broke the spell of local community production and leaded the districts toward a shift in the relations between firms. The increasing affirmation of leading actors, and the evolutionary pattern exhibited by industrial districts progressively brought scholars to move the focus of their studies from discussing an all comprising macro-structures to uncovering specific firms' dynamics, within districts (Coró and Grandinetti, 1999; Boschma and Lambooy, 2002). More recent studies (Carbonara, 2002, Iacobucci, 2004, Cainelli et. al, 2006) - also benefitting from a more long-termed perspective of IDs' development -have pointed out how in reality previous research might have "romanticized" the nature of IDs. The canonical district's paradigm, as such, could not cope with the ongoing global economic transformation. In fact - especially after the years of globalization- IDs became increasingly characterized by a more vertical and formal structure (Bianchi et ali., 2001; Brioschi and Cainelli, 2001; Whitford, 2001) replacing old mechanisms of competitions with relatively more stable relations and being characterized by the presence of so called "business groups'' able to condition heavily structure and performance of districts in themselves (Brioschi et al., 2002). In addition, Cainelli (2008), following Ferrucci and Varaldo (1994, 2004), argues that, policy makers should be less confident about industrial districts as broad geographical concept but, rather, they should be concerned about giving to the districts' analysis a more firm-centered perspective. Such perspective should be able to investigate also processes of innovation and renewal which often take place at firm's level rather than system level's[10].

To summarize, it might be observed how IDs have in effect functioned as an inspiring research topic for economics and institutional approaches as well as social sciences in general. From our review it appears clear that, if on the one hand many progresses have been achieved about explaining nature and potentials of IDs as systems, on the other hand it is possible to declare that not much has been done in order to shed light on the real firm population of districts. Furthermore, it is clear how all the above mentioned approaches and therefore studies and researches tend more to explain the dynamics of clusters/districts only by deriving them from a current situation.

Knack and Keefer (1997) conducted a horizontal cross-sectional research on 29 different word countries. For what concerns Third Italy's economic landscape, studies Putnam (1993) and Boschma (1999) conducted studies in order to assess the role played by social capital for the macro-region's development. However, despite the efforts made by scholars, it might be stated that the nature of social capital still remains rather ambiguous and the concept difficult to grasp (Woolcock, 1998; Boschma, 2005).

[10] Again, also in this regard, the assumptions adopted by most recent studies on Industrial districts seem to be in line with what has been stated by Boschma (2009) in reply to MacKinnon (2009) about the possible significant differences considering firms within the same district.

2.2 Difficult conceptualization and inclusion of history.

Considering the all above mentioned previous studies, it could be recognized how the spatial concentration of economic activities has, in effect, triggered a considerable debate among scholars from different fields of economic geography. Hence, granted that still nowadays a "one size fits all approach" about industrial clusters has not yet emerged (McCann, 2008), it could also be observed how both economics and institutional approaches struggled on different issues of research.

On the one hand, explanations based on geographical economics (and thus NEG) tend to be in their nature deductive, mechanistic and predetermined. As previously discussed, in fact, NEG -and recent geographical economics models in general- assumes for the analysis of spatial differences a relatively neutral space in which perfectly rational actors interact with each other creating a sort of idealized world analyzed. This methodology of approach cost to NEG models a considerable lack of empirical validation and the bias from proper economic geographers of not dealing with the "real world" (Martin and Sunley, 1996; David, 1999; Amin and Thrift, 2000) . On the other hand, the insights from the realm of proper and institutional economic geography focused on cultural and social in-deep case studies have often been labeled by geographical economists as hardly generalizable, difficult to operationalize and, in short, "non-scientific" (Rodriguez-Pose, 2000; Overman, 2004).

Setting aside their differences, however, it could be argued that an unfortunate "point of conjunction" between the above discussed approaches could be represented by the difficult conceptualization and inclusion of the role of history in the analysis. Precisely, both neoclassical and institutional approaches tend, to configure time only through a quite static and "photographic" analysis which does not allow a proper observation of the crucial role played by history in the formation and dynamics of industrial clusters(Boschma and Frenken, 2006; Garretsen and Martin, 2010).

When observing industrial spatial agglomerations, it becomes clear how the processes leading to progressive clustering of economic activities tend to be recognizable only over time. History, in fact, through mechanisms of conservation or accidental events, is argued to be responsible of the rise and fall of entire economic regions addressing them to different paths of development. In other words, as stated by Garretsen and Martin (2010), the economic landscape "is in itself an historical process and can only be understood as such". However, notwithstanding the important role played by the subject, it could also be noted how studies on industrial clusters often struggled to include historical evolution in their explanations of clusters' dynamics, this regardless the adoption of an economic or institutional approach.

In the case of NEG the contribution of history to the economic-geographical analysis is basically represented by accidental events and initial conditions of regions leading to possible multiple equilibriums. From this point of view, historical events mostly exogenous to industry process (as for example the fall of transportation costs but also historical events in general) are likely to impact the present inter-regional equilibrium situation. Therefore, the re-adjustment of the equilibrium, with consequent emergence of agglomerations, results in NEG models by the initial conditions of the regions analysed through processes of increasing returns, allowing for multiple equilibriums.

Thus, if on the one hand NEG models pay enough attention to history in terms of economic irreversibility and path-dependence, on the other hand, they in effect attempt to narrow down and pre-determine the possible development trajectories of agglomeration (concept hardly applicable in real world). Moreover, it should also be pointed out that history in NEG models does not figure as "real history" characterized (and characterizing) precise context-specific areas. Rather, geographical economics' history might only be conceptualized in its logical essence, as time gap between different equilibriums (Garretsen and Martin, 2010).

Probably more concerned with the concept of 'real history' are the approaches deriving from institutional economic geography and adopting a more inductive methodology of research. History of territory and institutions have been probably the main workhorses of PEG which

However, it must also be stated that, besides an obvious concrete difficulty in the operationalization of "real history" (which clearly varies from case to case study), the majority of IEG accounts suffered from a certain static analysis. As a matter of fact, in a large part of institutional studies, the current state of affairs (and therefore the solutions suggested) is derived only by current conditions, without a real attempt to connect a point of time "to everything else going around it" (Garretsen and Martin, 2010).

In a nutshell, it appears that, the study of industrial clusters would enjoy the insights of a more historical-oriented approach not only able to explain the motivations at the base of clusters' emergence but also to shed light on the dynamics which are responsible for their development over time.

To sum up, in the previous sessions of this paper we reviewed the different approaches and methodologies used in economic geography to shed light on the complex but at the same time attractive topic of industrial clusters. After an overview concerning the contributions of both Neo-classical and Institutional approaches to the study of respectively agglomerations and "milieux", we paid particular attention to the case of Third Italy and Italian Districts. In conclusion we discussed how, despite the efforts undertaken and the progresses made,

economic geography still struggles to include the role of history in its explanations about uneven development and, therefore, industrial clusters. In the next sessions of this paper, we will introduce the approach of Evolutionary Economic Geography and we will discuss its potential for what concerns a more dynamic and historical perspective in matters of industrial clusters development and evolution.

3. EEG: history and cluster evolutionary cycles.

After the premises given in the previous chapter the following one is devoted to outline and explain the approach used for the present research from a wider conceptual perspective. As such, firstly we will revisit and discuss briefly the paradigm of Evolutionary Economic Geography with its theoretical foundations. Secondly, we will discuss what is the approach of such paradigm in respect to the study of economic regions, industrial agglomerations and clusters. In particular, we will focus our attention on one of the major evolutionary concepts related to the notion of regional economic adaptability (Hassink, 2010): the one of cluster cycle. By introducing such concepts, in addition to complete the theoretical background of the present work, our purpose is also to explain why the application of such innovative notions might effectively bring new knowledge in the field of research.

3.1 The EEG paradigm: general outlines.

Evolutionary Economic Geography is a paradigm and approach developed purposively to reconsider the importance of history and therefore of the concept of place in the analysis of regional and urban development (Boschma and Martin, 2010). In recent years the paradigm was enriched by a consistent amount of research articles and publications, which have contributed to significantly crystallise what was at the beginning a multitude of self-declared approaches lacking a more coherent body of knowledge. However, still nowadays, EEG remains for its nature a paradigm under construction, thus open to new perspectives and studies able to fit with its inclusive framework.

The paradigm draws the majority of its principles directly from Evolutionary Economic theories that study the economy with a focus on how the latter self-transforms from within. Differently from mainstream approaches, evolutionary economics identifies process of innovation and technological progress as crucial drivers for the development of economic systems and as factors able to explain uneven industrial performance (Schumpeter, 1948; Nelson and Winter, 1982; Pavitt, 1984; Dosi et al., 1988; Witt, 2003, 2006). As such, this perspective leads to a dynamical and non-equilibrist interpretation of economic facts with an emphasis on the irreversible historical which are likely to strongly condition (but not determine) contingent and future situations. All this is related with a new emphasis put on the important role of knowledge and its circulation, considered as the effective main source of economic change, instead of monetary fluxes taken alone. In this sense, the approach is called evolutionary since largely based on the metaphor trascending the realm of evolutionary biology. This stated, it must be added that by considering the economic landscape itself as a complex process of evolution, EEG is not only a mere implementation of the spatial variable

in the framework of evolutionary economics, nor a simple transposition or re-application of concepts from other disciplines.

> "Basic concern of evolutionary economic geography is with the processes by which the economic landscape -the spatial organisation of economic production, circulation, exchange, distribution and consumption- is transformed from within over time…Evolutionary economic geography is concerned with the spatialities of economic novelty (innovations, new firms, new industries, new networks), with how the spatial structures of the economy emerge from the micro-behaviours of economic agents (individuals, firms, organisations); with how, in absence of central coordination or direction, the economic landscape exhibits self-organisation; and with how the process of path creation and path dependence interact to shape geographies of economic development and transformation, and why and how such processes may themselves be place dependent."(Boschma and Martin, 2010, p. 6-7).

The paradigm therefore appears as a distinctive and alternative paradigm, able to shed light on topics and issues largely neglected by previous approaches more focused respectively on formal mathematical modelling or on constructivist studies. Despite being an approach in its very infancy some general characteristics of EEG have been widely debated and recognized by scholars. In the next (sub)sessions we will try to sum up the characteristic of this new economic geographical paradigm and we will explain it benefitted the study economic landscape, regions and uneven development. The following paragraphs summarize briefly the main theoretical bases, characteristics and peculiarities of EEG.

EEG theoretical foundations: Generalized Darwinism, Path dependence, Complexity.

Deriving from Evolutionary economics, EEG deals with concepts deriving from evolutionary biology and complexity science with a particular attention to the spatial context. Following Boschma and Martin (2010), the theoretical "pillars" of EEG are to be found mainly in three different frameworks often overlapping and completing each other in scholars' research, notably: Generalized Darwinism, Path-Dependence theory, Complexity Theories. These themes are not to be considered detached in their nature, rather, they tend to exhibit a certain degree of overlapping in EEG researches.

To begin with, Generalized Darwinism is probably the most common approach to EEG and it represents the largest part of the insights in the recently born field of research. It mainly consists in the application and observation of concepts from the biological research -like

variety, novelty, selection, fitness, retention and adaptation- for the study of developing regularities in firms' populations (Hodgson, 2004; Hodgson and Kundsen, 2006; Esselzbitchler and Rigby, 2007; Boschma and Martin, 2010). The metaphor of Generalized Darwinism directly stems from concepts of evolutionary biology, adapted to the study of socio-economic contexts. In this regard, it must be pointed out that, the application of concepts from biology, in approaches like the one of EEG, is not meant to merely assume and re-apply them as tolls of analysis. Rather, due to the complexity of economic and social processes as complex systems (Witt, 2003, 2006), the concepts like generalized Darwinism are aimed to give valuable insights about general tendencies of regions' development, without the claim of establishing a one size-fits-all model. Precisely, following the more recent contribution of Esselzbichler and Rigby (2010), Generalized Darwinism examines how a population of heterogeneous entities, in this case firms or organizations), evolve through interaction among themselves and with a selection environment they themselves contribute to influence, exhibiting different regularities in the process. For this analysis, it is first necessary to assume a priori that populations of firms have to cope constantly with a "restless capitalism" (Storper and Walker, 1989; Metcalfe et al. 2006; Boschma and Martin, 2007) which makes firms compete for success worldwide, at the same time selecting the best performing and driving out the less fit subjects from the market. The concept of evolution in this sense, especially in the socio-economic environment, does not imply a clear progressing toward "advancement", but is instead a constant and restless process of selection, which depends any time from the contingent situation. For instance, as stressed by scholars, a premise like the one of a capitalist economy is crucial for the application of concepts like generalized Darwinism as a tool of research (Esselzbichler and Rigby, 2010). Starting from this assumptions, many were the researches which conducted studies of the population of firms in order to give insights on the dynamics of regional economic development and evolution of industry (see for example Hannan et al. 1995, Klepper, 2001, 2007; Kohler and Otto, 2008; Boschma and Wenting, 2007; Wenting and Frenken, 2007; Boschma and Ledder, 2008; Heebels and Boschma, 2010; Dahl et al., 2010,). In relation to recent years, although generalized Darwinism remains one of the main theoretical assumptions and procedures of research in EEG, the perspective of generalized Darwinism seems to present pros and cons. On the one hand, there is probably, nowadays, a greater availability of detailed historical accounts and ethnographic studies on industries development. On the other hand, the increasing processes of globalization as rendered the population of firms more connected with each other and less isolated, therefore, complicating research on selection's dynamics (Esselzbichler and Rigby, 2010).

The concept of path dependence is also one of the most peculiar theoretical traits of EEG (Boschma and Frenken, 2006; Boschma and Martin, 2010). Although the concept came across several definitions and it encompasses several themes and topics, it might be simply stated that path dependence is the conceptual incarnation of the proposition "history matters"(Boschma and Frenken, 2006; Simmie et al. 2008) in both evolutionary economics and EEG. The work on path dependence draws many of its insights from David (1988, 1993, 2005) and Arthur (1988, 1994), and sees in past events and recursive interaction the real shapers of economic development. The notion of path dependence is, in this regard, strictly linked with the concept of history and it might be argued being an attempt of operationalization of history in itself in EEG framework. Thus, the perspective of path dependence in EEG, is described by the more or less continuous state of development (not equilibrium) which characterises economic systems as an open systems, and sees a constant evolution of the economic landscape mainly shaped by past events (Boschma and Martin, 2010; Martin and Sunley, 2010; Martin 2010). Hence path dependent processes were recognized to be crucial for the evolutionary aspects of industrial clusters. Adopted first in Evolutionary Economics and organizational theories, the earlier attempts to include path dependence in economic-technical frameworks were devoted primary to the statement: "the explanation to why something exists intimately rests in how it became what it is" (Dosi, 1997), and basically relied on four stages of path development: pre-formation, creation, lock-in and dissolution (see David, 2001). It must be said that the notion of path dependence was for a long time associated with the directly linked concept of lock-in, which became also very popular and used in EEG scripts (Martin and Sunley, 2006). As such, central claim of David-Arthur's path dependence assumption, was to demonstrate that the evolution of industry is likely to occur from triggering chance events following long periods of (more or less positive or negative) stable lock-in. It became soon clear that, notwithstanding the various contributions of scholars to the topic (chiefly scholars from EEG environments,as: Grabher, 1993; Hassink, 2005; Scott, 2006; Boschma, 2007, Simmie et al., 2008), the concept of path dependence (and consequently lock-in) appeared still far from transparent (Martin and Sunley, 2006). Apart from the difficulties encountered in the definition of the topic in itself[11], much difficulty was encountered in implementing the same concept of path dependence to actors with different degree of complexity (Castaldi and Dosi, 2004). Precisely, it became clear how more complex and composite actors (like institutions and industrial clusters) were likely to display different patterns of path-dependence compared to simple technical systems

[11] Martin and Sunley (2006), in their article about path dependence, have listed some of the difficulties already encountered in the definition of the concept (p.).

(Martin, 2010)[12]. Moreover, especially in its form of lock-in, path dependence was treated in many studies (David, 1993, 2005; Setterfield, 1997; Sydow et al., 2005) as a more or less permanent state of equilibrium from a stage of development to another, thus, unable to grasp the usually complex evolving nature of clusters (see the critiques of Martin and Sunley, 2010). For this reasons, more recent EEG's studies, have therefore attempted to re-qualify path dependence in its more dynamic aspects. Some discussions have partly disentangled the concept from the perspective, which sees path-dependent solely as a creator of lock-in. In addition, much more attention has been drawn to the processes responsible of the continuous change rather than lock-in (Esselzbichler and Rigby, 2007, 2010; Martin and Sunley, 2010; Martin, 2010). Thus, a new frontier in the conceptualization of path dependence seems to be represented by its contamination with complexity theory, which might contribute to render the concept of path dependence more flexible and adaptive for the study of clusters and economic development in broader terms.

It is exactly Complexity Theory the third component of the general EEG theoretical framework. Recent contributions to economic theories have in fact recognized that, when talking about economic landscape, the discussion basically concerns an highly complex system (Martin and Sunley, 2007). Any kind of economic landscape (including cities industrial clusters), is clearly characterized by openness, variability and seems to incarnate, at all the effects, the conception of highly complex systemin which actors are able to actively shape- modify the surrounding environments and are conditioned at the same by other actors' behaviors (Foster, 2005). Following Martin and Sunley (2007) (and, therefore, Beinocher, 2006) complexity economics, differently than mainstream economics, deals with " open and non-linear systems made up by agents with bounded rationality who learn to adapt; who interact through constantly changing networks; whose micro-behaviors and interactions are the source of emergent pattern and order at the macro-level and who are the source of the constant novelty that imbues the economy with its evolutionary momentum" (Martin and Sunley, 2010, p. 98). Conceptually (and currently), it is not feasible to describe the whole complexity thinking with a unique and exhaustive rational model. Complexity thinking, applied to the realm of economic geography, primary deals with concept like self-organization, adaptation, emergence, hysteresis and panarchy – following the works of Martin and Sunley (2011) following Cumming and Collier, (2005); Martin and Sunley, (2011) following Deacon, (2006); and Martin, (2011). Notions from complexity thinking have been thereby introduced in EEG research, in order to focus more on the "far-from-equilibrium"

[12]Explained briefly, and following Martin (2010), it is clear that the observation of the path dependence phenomenon results easier when considering an example like the one of the QWERTY keyboard (see David, 1999), where the (f)actors involved in process creating "inertia" could be better isolated. However, the identification can become pernicious when attempting to apply the same line of reasoning to more theoretically composite and open socio-economic systems (such as the alleged path dependence of a whole industrial cluster).

aspects characterizing socio-economic entities. Precisely, recent studies, have attempted to demonstrate that greater attention should be paid not only to the analysis of those factors leading to a sort of stabilization and inertia in the economic landscape (as for example selection, retention, lock-in), but also to the observation of the aspects which sees economic systems as constantly transforming and adaptive entities (Martin and Sunley, 2011). Martin ad Sunley (2007) conclude by saying that, in order to draw some useful insights from complexity for the emerging EEG paradigm, the translation of theories from other fields to the one of EEG shall be done carefully also for complexity thinking. Considering recent progresses of the paradigm, despite complexity thinking is, among theoretical foundations, the one of most recent implementation - thus, the one that till now has received less attention from scholars –, the concept has advanced particularly on some aspects (Martin and Sunley, 2011). In fact, although complexity theory encompasses many arguments, one way of dealing with complex systems in EEG is through studies of networks (Boschma and Martin, 2010), which -as we will discuss later- have increasingly gained attention in recent EEG's research.

Methodology.

Assuming that the economic landscape displays a complex nature and that economic evolution includes both micro and macro processes, EEG scholars tend to favor for their investigation a sort of "methodological pluralism", based on both formal modeling and appreciative theorizing (Boschma and Frenken, 2006). EEG does not repel the use of formal models and often makes use of statistics and stable starting assumptions in its research, however, it also tends to focus its attention on more contextual case studies in which outputs tend to emerge more inductively than deductively. The variety of methodological approaches allowed by EEG has in the last decades contributed to attract the interest of many scholars also from different backgrounds (Boschma and Martin, 2007) it also originated, rather than a single and coherent body of knowledge, a multitude of different approaches that enriched the topic from different perspectives and with different contributions (Dopfer and Potts, 2004). Studies of more statistical and analytical type on agglomerations, regions, relations and networks are often backed by more interpretive and qualitative data aimed to confirm and consolidate the aim of the research, or vice versa. To make an example, if on the hand EEG might study the development of clusters by using the tools of statistics, in order to assess the effects of size, employment, networks and different degrees of firms' survivability related to their background and experience, on the other hand the analysis of cluster's evolution could also make use, for the same purpose of enquiries and qualitative and descriptive data this also in order to shed light on the macro-structures affecting the cluster as a system. In both the

cases, quantitative and qualitative, the existence and availability of historical data and ethnographic studies is crucial for an EEG research perspective (Esselzbichler and Rigby, 2010). In recent years[13], the approach of EEG has progressively crystallized its methodology and, although the approach did not renounced to its methodological eclecticism and openness toward the construction of new theories, some main features of EEG´s "way of doing" have progressively emerged steadier from scholars researches (see Boschma and Frenken, 2011). In sum, it might be stated that EEG, still currently presents itself as an approach based on a sort of theoretical realism convinced of the existence of a reality "out there", but always open to new epistemological interpretations[14] (as we will also stress later). EEG perceives evolution in plural and heterodox manners, but still following the passages of a rigorous and at the same time composite logic, advocating both quantitative and qualitative data in the empirical research program.

Firms, routines, bounded rationality and WLO concept

Differently by the majority of the economic theories, based respectively on rationalizing agents creating equilibriums or institutions as macro-shapers of economic landscape, EEG sees in firms and their routines the main unit of economic analysis. Hence, EEG mainly studies the distribution in time-space of routines, within the economic landscape (Boschma and Frenken, 2003; Boschma and Frenken, 2006; Esselzbichler and Rigby, 2007; Boschma and Martin, 2007; Boschma and Martin, 2010). Following the assumptions of evolutionary economics, firms are not conceived as uniform in their nature, but differentiated in their capabilities such as: knowledge, administration and management (Cooke and Laurentis, 2010), factors that, together, contribute to built the organizational routines of a determinate firm. Routines are not permanent and static, but are subjected to a continuous process of mutation (Staber, 2010). In this regard, both firms' previous experiences and the capacity of learning from the surrounding environment are likely to condition significantly the creation of future routines. For all these mentioned reasons it might be stated that different organizational routines characterize -more or less uniquely- every single firm and organization, and they became the starting point of EEG's research from the micro-level (Boschma and Frenken, 2006). What is crucial in this sense -especially considering the difference with previous

[13]This especially after the contribution of some "landmark" publications, like the Handbook of Evolutionary Economic Geography (Boschma and Martin, 2010).

[14]EEG might be considered a realist approach at all the effects, since it is convinced about the existence of a real word of physical things, structures and relations, independent from human senses and therefore independent from our perception and cognition of those things (Cloke et al., 1991; Panelli, 2004). However, at the same time, like the other realist approaches, the paradigm is built on the assumption that knowledge is a social and historical product (Robson, 2002). See Smith (1998) or Foldi (2006) for insights about the application realist philosophy to the contexts of social sciences and human geography.

paradigms -, is that the incorporation of the cognitive routines' limit: not only rules out from the EEG's framework every notion based on an a priori equilibrium based on universal maximization and rationalization of agents but also it tackles the assumption that everything has to from a macro-structure. The focus of the research is probably more at a sort of meso-level and the spatial economic landscape itself is conceived as a continuous disequilibrium, mainly caused by differences in the knowledge spreading among different routines (Maskell and Malmberg, 2007).

EEG's claim (in line with evolutionary economics) is that, in a competitive economic environment, the constant selection of firms is in turn followed by an as much strong selection and consequent spatial diffusion of fitter routines (Esseltzbichler and Rigby, 2007; Boschma and Martin, 2010). The selection process does not only affect the micro-level of routines and organizations, but works further on the macro-level of institutions, of which the effects are likely to influence directly the "playing field" of firms (Boschma and Martin, 2010). It is important to note thatfirms' routines, however, are not seen as completely and deliberately independent in their nature, but are in turn constrained and conditioned by meso-macro-structures of which they are at the same time shapers and shaped (Boschma and Frenken, 2006, 2009; Boschma and Martin, 2010). Thus, when using an EEG perspective, economic landscapes themselves might be interpreted as "historically grown spatial concentration(s) of knowledge residing in organizational routines" (Boschma and Frenken, 2006, p 278-279) in which spatial structures of the economy emerge from the micro behavior of economic agents (Boschma and Martin, 2007).

In EEG's perspective, actors tend to increase their benefit in the most advantageous and profitable way, but are assumed to exhibit at every moment a certain degree of bounded rationality, which hardly permits them to choose and undertake the best rational and utility-maximizing decisions time by time (Boschma and Frenken, 2006; Esselzbichler and Rigby, 2010). Besides, EEG, also considers routines heavily influenced in their contingent situation by past experiencesand knowledge, thereby, path-dependent. Following, the contributions of Maskell and Malmberg (2007) and Malmberg and Maskell (2010) it is hinted that local "myopic" actors try to develop, by trial and error, advantageous routines in order to cope with more ease with the constant challenges presented by deliberate choice in a selection environment (see also Nelson and Winter, 1982; Coriat and Dosi, 1998), in doing so, they tend to specialize and reinforce the local socio-economic pattern of development. However, in the process, they will also tend increasingly to ignore the potential offered by other opportunities judged distant from their current situation and they will try to solve their current problems favoring solutions closer to their current "way of doing". In this perspective, in addition to develop different competencies in time and space, will also tend to increase their

peculiar regional/territorial patterns of routines. Precisely, the routines alleged to be fitter - especially through mechanisms of selection and replication in the same or related industry and within the neighbouring territory (Boschma and Frenken, 2009a) - will contribute to the creation of distinct economic regions, different not only for what concerns the mere industrial specialization, but also in regard of the whole general organizational profile of the regional populations of firms (Esselzbichler and Rigby, 2007, 2010). Consequently, dominant routines in both firms and regional institutions tend to be durable and persist over time. However, whenever it occurs that dominant routines are rendered obsolete due to external or internal factors, the situation may also turn into possible technological or institutional lock-ins for the regional economy (Grabher, 1993; Cornwall and Cornwall, 2001; Hassink, 2005, 2010). Spatial-economic actors must therefore be able to renew, every now and then, their set of routines, in order to be prepared for the catching of potential innovations, which can in effect improve their performance or open-up new horizons in their markets. This could happenon the territory in more endogenousterms: as for example thoroughthe affirmation of a Schumpeterian and particularly innovative firm, or with the help of regional R&D facilities – which might be present at many different levels of regional organizations -, or exogenously in respect to the territory in question, with the creation of knowledge pipelines and the improvements of firms' absorptive capacity (Bathelt et al. 2004; Malmberg and Maskell, 2010) or the arrival of a firm or organization, coming from the outside of regional borders and introducing new knowledge (see for example Iammarino and McCann, 2010) .

The WLO concept (Windows of Locational opportunity) (Scott and Storper, 1987; Storper and Walker, 1989; Tyre and Orlikowski, 1994; Boschma and Van der Knaap, 1997; Boschma, 2007) is the analytical framework used by EEG to investigate on the spatial processes of regional renewal and development. It basically states that, whithin regions, firms accumulate different set of competences and routines over time. Therefore, the more similar are the routines to those needed for an incoming industry, the more the region is inclined and advantaged to move toward a certain innovation (Boschma, 2007). However, WLO also acknowledges that, in such context, the "chance" factor is still likely to condition regional development, and also disadvantaged regions may always be able to adapt and modify their routines and environment in order to undertake innovation. What we must also observe, is that the component of time plays a crucial role in such framework. In fact, while in the first stages of a developing industry the opportunities for regions renew, following the wave of a potential innovation, are more available and spatially diffused (situation of open WLO), over time the possibility of regions to evolve in a certain kind of industry will be progressively reduced since an industry will take shape only in some regions which will be likely to obtain

a specific advantage on others. In addition, the industry itself will have acquired a more routine-based specific dimension difficultly transferable and spatially bounded (closed WLO).

To sum up and also make a point with previous sessions, it could be said that the main purpose of EEG is to study the spatial economic development from a perspective of self-organization, allowing heterodox methods of research, however, the main purpose of EEG is to analyze how spatial development evolves "from within"(Boschma and Martin, 2010). In doing so, the paradigm investigates on: dynamics of micro routine creation, fitness and spatial diffusion among organizations; economic actors' (bounded) knowledge accumulation, eventually leading to spatial inertia; and , nonetheless, processes of innovation and diffusion of knowledge within the spatial economic landscape .

Knowledge, networks, proximity, relatedness and regional branching

Concepts like knowledge and innovation stem mainly from evolutionary economics studies (Metcalfe et al., 2006) and have been adopted by EEG for the analysis of economic landscape (Boschma and Martin, 2010). Furthermore, attention is paid by the paradigm to the processes of knowledge creation and exchange between spatial economic actors. It is for this reasons that, especially in recent years, EEG has been focusing on the emerging, and at the same time conceptually embedded among each other issues, of: networks of knowledge, proximity concepts and industrial relatedness.

To start with, EEG embraces the idea that processes of knowledge diffusion and innovation within the economic landscape might be far from concepts like "spillover", "knowledge in the air"[15]. Precisely, although also previous studies in various disciplines – hence including the field of economic geography- have become aware since decades about the importance of networks for spatial economic development (Granovetter, 1985; Yeung, 2000; Sorenson, 2003), especially EEG scholars went deeper in explaining the processes of knowledge exchange also by applying theories derived from social networks analysis to the context of firms and clusters (Bell, 2005). As such, without denying the importance of previous studies on agglomeration externalities, EEG is attempting to give a more concrete explanation about the modalities of knowledge production and circulation among regions and clusters. In first instance, following the seminal contribution of Barabasi and Albert (1999), many scholars -belonging or akin to the EEG field -, devoted their efforts to clarify the entity, type and

[15]The critique of EEG is mainly oriented to those theories interpreting clusters and regional agglomerations as mere and undifferentiated communities of small firms, in which all the actors could benefit from district externalities in a sort of pervasive "collective learning". (Zucchella et al. 2004; Giuliani, 2007; Boschma and Ter Wal, 2007; Morrison, 2008; Ter Wal and Boschma, 2009).

importance of knowledge networks in the economic landscape of regions and clusters (see, in this regard, Staber, 2001; Breschi and Lissoni, 2004; Giuliani and Bell, 2005; Giuliani, 2007, 2010; Boschma and Ter Wal, 2007; Morrison, 2008; Morrison and Rabellotti, 2009; Gluckler, 2010; Denicolai et al., 2010; Breschi et al., 2010; Cassi et al., 2012). Despite often slightly different in their topic of research, questions and assumptions, all the network-oriented EEG studies give similar outputs and insights. Firstly, they demonstrated empirically, and with more analytical rigor, that social networks certainly play a crucial role in the economic landscape, primary by influencing the innovation processes of the industry (Uzzi, 1996; Zaheer and Bell, 2005; Ter Wal and Boschma, 2009; Boschma and Frenken, 2010). Secondly they argued that the factors alleged to be the motivation of emergence, advantage and resilience of many industrial regions, clusters, agglomerations were all but to be taken for granted. Such studies, have evidenced that, also within the same clusters and spatial economic realities, the modalities with which knowledge is shared among firms is often selective and hardly accessible. Following logics of preferential attachment - which see actors connecting primary with their "similars" in order to achieve valuable knowledge (Giuliani, 2010) -, EEG have harshly questioned the old strong assumptions about the overlap between space of place and space of flows in industrial clusters. Put more simply, EEG scholars proved that being well connected could be as (if not more) important for firms than being well co-located (Giuliani and Bell, 2005; Asheim et al. 2011).

However, recent EEG studies were not only aimed to discover how the quality of networks impacts on spatial development, but also, they were concerned about the logics behind the creation and regulation of networks, in a dynamic perspective (Ter Wal and Boschma, 2009). For this reason EEG has, in recent years, focused its efforts on the study of different "proximity dimensions" influencing innovation (Nooteboom, 2002; Boschma, 2005; Boschma and Frenken, 2010; Ter Wal, 2011; Balland, 2012; Broekel and Boschma, 2012; Balland et al. 2012). The study of proximity draws its concepts from the French school of proximity dynamics (Rallet and Torre, 1999; Torre and Rallet, 2005) and it allows deepening the analysis of the processes of network formation starting from the characteristics of the spatial economic actors (Boschma and Frenken, 2010). Central claim of such perspective is that the network linkages between organisations – hence, firms or economic actors in general -, rather than emerging randomly and fortuitously, are largely conditioned in their nature by several dimensions of proximities, notably: cognitive, organizational, social, institutional and geographical proximity.[16] A certain degree of proximity is the necessary requirement for a

[16]Explained briefly, and following Boschma and Frenken (2010): "cognitive proximity, indicates the extent to which two organizations share the same knowledge base; organizational proximity, the extent to which two organizations are under common hierarchical control; social proximity, the extent to which members of two organizations have friendly relationships; institutional proximity, the extent to which two organisations operate

fruitful knowledge exchange and enhances absorptive capacity between organizations. In addition, different forms and types of proximity may supply the lack of other proximities, serving equal purpose in respect of processes knowledge exchange. However, it has been argued that also the presence of too much proximity could be detrimental for innovation, since it could increase the uniformity in the economic actors' population, thus, leading the situation to different lock-ins caused by the overly-present kind of proximity (the so called "proximity paradox", see Boschma, 2005; Boschma and Frenken, 2010, Broekel and Boschma, 2009). In sum, following the EEG perspective, it appears that, in order to benefit innovation and favour the creation of favourable networks for knowledge transmission, the distances in terms of different proximities between actors should be neither too ample nor too narrow. Studies on proximity have also recently evidenced how the dimension and importance of different proximities are likely to change depending from the particular phase of cluster development (Balland et al., 2012). Among the different types of proximities, cognitive - or "technological" (Boschma and Frenken, 2011) - proximity is particularly important for the creation of connections between economic actors. Firms with similar competencies and routines and, hence, with optimal distance in terms of cognitive proximity, are more likely to connect, since they are able to exchange valuable knowledge.

Thus, in turn, strictly linked with the concept of proximity, is the one of industrial relatedness -which has recently gained ground in EEG's studies -, but at an higher spatial level. When concerning, in fact, the process of spatial economic development, and following both quantitative and qualitative studies, it has widely been observed that regions tend to move their economic activities in closely related sectors, not far from the already existent system of production (Boschma and Wenting, 2007; Hidalgo et al. 2007; Boschma and Frenken, 2009; Buenstorf et al., 2010, Cooke an De Laurentis, 2010, Fornahl et al., 2010). At the same time, there is evidence that, within a given region, industrial sectors tend to take some advantage particularly from the interception of a kind of knowledge technologically akin to the one of the their industry, rather than from any kind spillovers generated by the industrial environment (Frenken et al. 2007, Esselzbichler, 2007, Bishop and Grimpaios, 2009). In other words, also regional industrial sectors tend to favor, especially to boost processes of innovation, the availability of knowledge not too close, but at the same time not too distant, from the one of their own type of industry - thus suggesting a cognitive proximity dimension between industrial sectors at an higher spatial level - (Gilsing et al., 2007; Broekel and Boschma, 2009). For these reasons, EEG scholars progressively developed also the concept

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under the same institutions; and geographical proximity, the physical distance or travel time separing two organizations." (Boschma and Frenken, 2010, p. 121). It could be noted that recent researches and accounts tend to leave out institutional proximity and divide it between organizational and social proximity (for example Balland et al., 2012).

of industrial relatedness and in their studies (Frenken et al., 2007; Neffke et al., 2009; Boschma et al., 2009; Boschma and Iammarino, 2009; Boschma and Frenken, 2011a, 2011b; Hartog et al. 2012), in order to elucidate which factors lead regions to diversify economically and, therefore, gain a certain regional advantage in respect of some others. In particular, much attention has been recently paid, both in terms of academic research and policy relevance, to the concepts of related variety and regional branching (Boschma and Frenken, 2011; Asheim et al. 2011). Although studies on the topic are still in progress, related variety within regional industrial sectors has been alleged to be particularly important for the processes of innovation.

In regional economy the degree of variety corresponds to the plurality of different sectors of industries that feed the regional economy itself. While some regional industrial sectors might be divided by others by a neat gap in the type of production - and thereby in the knowledge base (unrelated variety) -, related sector, within a certain region, may display similarities in terms of competencies, knowledge base and sectors of productions[17]. Unrelated variety might give some benefit to regional economies (Jacob's externalities): firstly, by simply enhancing the "the techno-political environment" apt to innovation (Cook, 2010), secondly, by protecting the labour market from external shocks - which are likely to hit periodically singular sectors-, thus by creating much more flexibility in terms of job mobility. However, related variety, in addition to the before mentioned advantages would allow to maintain a certain degree of diversity in the regional economic environment, permitting, in the meantime, positive externalities, spillovers and interaction and recombination between different regional economic sectors (Hausmann and Klinger, 2007; Frenken et al. 2007; Boschma and Frenken, 2011)[18]. Furthermore, EEG scholars argued that an abundant presence of related variety among sectors, in addition to innovation, might also prevent the regional economic environments from eventual lock-in paths, giving to regional sectors, which are facing challenges, more opportunities to move in knowledge-base related fields. Hence in turn, following the perspective of regional branching, new industries, rather than appearing randomly (or accidentally) on the territory, tend to emerge, with a path dependent process, from the spatial endowments of the already existing regional industrial sectors (Neffke and Henning, 2009; Neffke, 2009): often via processes of spinoffs diversification, labor mobility and networking - which are all assumed to be characterized by a local bias -, or, at times, through a deliberate interaction and recombination of different (but related) sectors of industries in the region (Boschma et al., 2009; Boschma and Frenken, 2011).

[17]Examples of related variety could be metallurgy with machinery, or high-tech with telecommunications.
[18]Put simply, and following the article of Asheim et al. (2011), although diversity and Jacob's externalities might be crucial for innovation, "it is unclear what a pig farmer can learn from a steel company despite the fact they are neighbours" (Asheim et al.,2011, p. 895).

These recent contributions of EEG oriented to investigate the "spatial knowledge economies of regions" should not only be confined to academic field –where probably they have seen, till nowadays, the majority of their success-. In fact, besides being eye-opening in matters of innovation and economic spatial diversification, this new suggestions might also be of particular value for the complex realm of policies, especially if combined with insights from other perspectives and approaches (see Asheim et al., 2011). Therefore, concrete explanations might been given when it comes to investigate about the practical possibilities and methodologies for eventual industrial regional de-locking, diversification and renewal, or about explaining phenomena of more global nature, as for example the increasing advantage of rich countries over the poorer ones[19]. Such discourses, as we will see, partly reconfigure the importance of macro-contexts also in EEG.

Non-determinism and macro structures, regional setting and institutions

As already discussed, EEG focuses mainly on micro-processes which lead to the creation of "real space", albeit, without denying the importance of created macro-structures. For what concerns the importance of a favorable environment and previous endowments in the growth of a new industry, EEG has been very clear in declaring its position from very early studies (Storper and Walker, 1989, Boschma and van der Knaap, 1999). The discontinuity created by the emergence of a new industry, is likely to create a gap between the already available spatial endowments present on the territories and the new technical and sociological requirements matching with the incoming innovation. Thereby, from an EEG perspective, the presence on the territory of favorable elements - like an already skilled pool of labor; entrepreneurial culture and capacity; or the availability of financial resources – might be considered as a facilitating (Boschma and Lambooy, 1999) but not sufficient and necessary factor for the proliferating of a new industry (Boschma, 2007). Rather, it is more frequently observed that emerging (or moving) industries have the capability to shape and modify their environments, adapting them to their needs. Hence, creating the nature of the spatial economic landscape in itself (Storper and Walker, 1989; Boschma, 2007; Iammarino and McCann, 2010). In a similar vein, EEG basically refuses to take as granted the role played by formal and informal institutions in the processes of spatial economic development. The assumption is that, also institutions, especially due to their loose and non-binding nature

[19]This is the main finding in the seminal paper of Hidalgo et al. (2007), which suggest a different interpretation of the motivations leading to different performance in national economies. It has been recognized that, what is also suffered in particular (but not only) by poor countries – in addition to an obvious lack in the availability of financial and institutional capitals– is the concrete impossibility of industrial sectors in the periphery of product space to move closer to the core where innovation and transformation are much more frequent. Thus, a general difficulty encountered by un-advantaged national economies when attempting to perform the process of regional branching.

(Boschma and Frenken, 2009) in respect of a specific incoming innovation, are unlikely to be determinant during first stages of industries development and clusters' growth. Since institutions are hardly ever presented as main triggers of an emergent industry alone (Bellussi and Sedita, 2009) and EEG tends to more consider them as constraining entities rather than active shapers of economic landscapes (Maskell and Malmberg, 2007; Boschma and Frenken, 2006, 2009). In addition, instead of considering them as detached sovra-structures, EEG holds that institutions are themselves embedded and path-dependent in regard of the contingent economic establishment, thus, they condition but at the same time are conditioned by the socio-economic environment (Esselzbichler and Rigby, 2010). Precisely, to cite Bellussi and Sedita (2009): they often start as exogenous to the cluster and progressively become endogenous during clusters' development.In short, "new is grounded in the old but not in a deterministic way" (Boschma, 2007, p. 8).

However, it might also be observed how, especially in recent years (also under pressures of some critiques as for example the one of McKinnon et al. 2009), EEG has considerably increased its interests in assessing the more direct role of macro-structures in spatial development, both in terms of advantageous territorial pre-endowments and favorable institutional settings. First, previously discussed studies about relatedness have evidenced the importance of an already present generic-knowledge to boost innovation on the territory (especially during the phases of open WLO). Pre-endowments in terms of similar (but not too closely related) technological skills toward and innovation, might favor considerably the entrance of a new industry within a region (Boschma and Wenting, 2007; Buenstorf et al. 2010). Thus, even though un-advantaged regions may still be able to attract resources for the creation of a new industry (Boschma and Van der Knaap, 1997), territories with related industries clearly own an advantage in providing, at early stages, large pool of already existent competencies and availability of entrepreneurship (Boschma and Frenken, 2011; Stam, 2010) and related competencies. Secondly, recent contributions have also been oriented to define more in deep the role invested by institutions from an EEG's perspective. Seminal in this sense have been the articles of Strambach (2010), who stated that the attitude of institutions toward incoming industries might be "plastic" and cumulative instead of only revolutionary and reconstructive; and Schamp (2010), who focused instead on the modalities of development, which lead different populations of firms and institutions to co-evolve in the same territory. The topic of institutions has recently gained much more attention, so much so Boschma and Frenken (2011) have enlisted it to become one of the future research horizons in EEG[20]. In this sense, the paradigm of EEG is therefore in constant construction and

[20]The authors discuss five different points on which to develop an EEG approach respectful of institutions' role (see Boschma and Frenken, 2011, p. 9-10)

expansion and, as we will lastly discuss, remains open also to the inclusion of insights and suggestions from other paradigms and approaches.

Progresses of the paradigm and current debates

EEG remains an open an open, variously utilized and eclectic paradigm. In recent years, after having contributed considerably to shed new light on the phenomenon of industrial clustering through the study of population of firms, processes of knowledge diffusion and importance of history, EEG is progressively moving toward the study of industrial relatedness, as witnessed by the already discussed variety of studies that are flourishing around the topic. These researches have given (and are giving) a consistent contribution to the already existent studies on agglomeration externalities in geographical economics (including concepts like MAR externalities and new theories of New Economic Geography) and are furnishing some potentially useful tools of investigation, which could accompany the already existent progresses in geographical economics (NEG) (Boschma and Frenken, 2011)[21]. Meanwhile, the paradigm has not yet stopped its more introspective theoretical debate and, after having matured its emerging empirics (Boschma and Frenken, 2011), is still in open search of theories and concepts, which can enrich its perspectives of analysis concerning uneven spatial development. Some scholars have suggested that EEG would enjoy a deeper study of the role of agency in order to strengthen its power of analysis. Therefore, besides firms as main unit of analysis, in recent years, EEG started also to take in more considerations insights deriving from the geographic studies on entrepreneurship (Jacobs, 1969; Sorenson, 2003; Breslin, 2008; Stam, 2010) and the role covered by agency strategic action and deliberate choice in economic evolution (Staber, 2010; Henn and Laureys, 2010, Bristow and Healy, 2013). This suggestions would lead the paradigm to focus even more on the micro behaviors of the actors interacting on the economic landscape and would shift the attention on human actors and micro-levels which constantly display a certain kind of fluidity rather than stability (Staber, 2010). Similarly, recent attempts in the implementation of concepts from complexity thinking were aimed to give EEG an even more dynamic perspective about the restless and changing nature of the economic landscape.

However, it is probably within the field of proper economic geography itself, and around questions about institutions and power, that EEG has witnessed one of its fiercer confrontations. A discussion emerged, in fact, among "proper" economic geographers,

[21]In this regard interesting is the intervention of Martin and Sunley (2011), which reflects on the recent policy implications of economic geography theories. The authors - in line with Krugman (2010)- support the assumption that a dialogue between geographers and economists is increasingly needed, this especially to improve the quality of policies in the field of economic geography.

supporting respectively the perspective of EEG and its akin - yet different in many regards - approaches deriving from Institutional and Relational Economic Geography[22]. Thereby, the ‘’tug of war’’ between the two approaches generated an important confrontation, which in turn leaded scholars to consider, not only the discrepancies, but also the opportunities presented by the complementarity and variety between the paradigms (Hassink and Klaerding, 2009; Grabher, 2009). On one the one hand, insights from relational economic geography could benefit to a better understanding of “knowledge transfer, production networks, supply chains and money flow” (Hassink and Klaerding, 2009, p. 23). Furthermore, studies based more on a power and actor-oriented approach may be of some help when investigating the insurgence of industries linked to agency, external knowledge pipelines (extra-cluster linkages) and capacity of regions to reinvent themselves and attract resources (see for example, Bathelt, 2003, 2007; Bathelt et al. 2004; Yeung, 2005; Bathelt and Gluckler, 2011). On the other hand, EEG provides a more empirical and testable framework for the study of economic geography. Starting from the micro-level, EEG has been able to give concrete and convincible answers to long debated questions in economic geography, as for example the ones concerning the processes of new industry emergence, and cluster development. Thus, although some EEG’s concepts, such as path dependence, are still under construction, the EEG paradigm as devoted much more attention, compared to the relational one, to the importance of historical processes in the economic landscape (Martin and Sunley, 2006) and to endogenous mechanism of macro-structure creations. Following Hassink and Klaerding (2009) it appears that the two paradigms, rather than antithetic, should be considered complementary. In effect one paradigm does not deny the perspective of the other, and might also be used simultaneously. Besides, both the paradigms, in addition to assumption of real space and bounded rationality, share the same interest for the importance of all sorts of spatial networks for economic development (Yeung, 2005; Giuliani, 2010; Gluckler, 2010). Furthermore, recent approaches, more or less “hybrid” in their construction, are attempting to apply a mixture of theoretical insights from institutional, relational and evolutionary paradigms[23].

In sum, it might be stated that, also considering recent years progresses, EEG is currently managing to fulfill its previously announced role of interface between different paradigms of

[22] The clash took the shape ofa theoretical debate between scholars from different paradigms of proper economic geography (notably: McKinnon et al., 2009 and Pike et al. 2009 on the side of relational-institutional-marxist economic geography, and Sunley, 2008, Boschma and Frenken, 2009; Hodgson, 2009, supporting instead an EEG’s perspective). Main issues of the discussion were the validity of Generalized Darwinism as tool of research in economic geography, and the role given to institutions and power relations.

[23]The article of Jacobs and Nooteboom (2011), for example, is an attempt to apply the evolutionary concept of Windows of Locational Opportunity to the context of institutional choice for development, or again, the article of Asheim et al. (2011), which combines insights from different economic geography paradigms to build a more solid frame for regional policies.

economic geography (Boschma and Frenken, 2006). It has attracted the interest and used the insights of many scholars from various socio-scientific backgrounds, plus, at the same time, is still facing possible perspectives of construction and expansion. Thus, to conclude, we quote Grabher (2009) who stated, in regard of EEG's pluralism, that it should probably be better considered as one of the innovative aspects, in which rests the strength of the emerging paradigm, instead of a mere theoretical "immaturity".

3.2 EEG and the study of regions and industrial clusters

Insights from EEG have been crucial to shed light on the processes at the base of industrial clusters' evolution and development giving an alternative interpretation of the dynamics responsible of their emergence and functioning. In the next sessions of this report we will briefly summarize what have been the main contributions of EEG for what concerns the study of industrial clusters, regions and economic agglomerations in general.

Emergence, growth and spinoff process

As stated by Boschma and Martin (2010) Marshallian externalities might be present in industrial districts, however, they should better be recognized as an outcome of agglomeration rather than a precondition for their emergence. Furthermore, while traditional theories on industrial clusters tended more to focus on the role of clusters as "growth producers" and incubators of firms, at the same time they partly neglected the hidden dynamics at the base of their origin and responsible of their development. Furthermore, notwithstanding the great deal of attention given by mainstream theories to topics such as knowledge and innovation, few efforts have been undertaken by applicants in order to integrate these concepts in the study of clusters (Cooke and De Laurentis, 2010)[24]. In this section, we will explain briefly what has been the contribution of the EEG to economic geography, in particular by focussing on the new perspectives opened by the paradigm in matters of industrial clusters' study and evolution.

To begin with, it must be pointed out first that, also when following an EEG's perspective, clusters are still considered essentially as entities of complex nature and difficult interpretation. The definition in itself of "what is a cluster" presents some difficulties (Martin and Sunley, 2003; Maskell and Kebir, 2006). In such regards, EEG partially agrees with what

[24] In addition, as stated by Cooke and De Laurentis (2010), mainstream theories often tend to confuse and use indifferently the terms "cluster" and "region".

has been stated by Arthur (1990) and Krugman (1998) who stressed the unpredictability of the precise antecedents and incidents, which are responsible for the early emergence of a new cluster (Malmberg and Maskell, 2010). This suggest that, even when it is possible to isolate a single triggering factor responsible for the creation of a cluster, investigating on the effective reasons which brought the latter to happen, might become an endlessly and blurred retrospective research, without clear seizing of precise causes (Saxenian, 1991; Maskell and Malmberg, 2007; Dahl et al., 2010). According to Menzel et al. (2010) the emergence of a cluster appears as a rather idyosincratic process in which the seeds responsible for cluster creation may come from different sources, namely: regional learning accidental events and strategic action. Labour inflows in the regions (Otto and Fornhal, 2010) and the availability of venture capital (Avnimelech and Teubal, 2010) in the pre-emergence stages have also been identified as important externalities, which can give additional bases to the process of cluster formation. It must be noted, however, that the majority of this findings relies on case studies of difficult generalization. In other words, while it is possible, in matters of cluster formation, to trace an ex-post explanation transcending the mere causality, no single explanation accounts for all the clusters and observations must always take into account multiple and various factors (Sternberg, 2010)[25].

What is certain, however, is that EEG scholars managed to give an alternative, realistic and convincing explanation about the dynamics responsible of clusters' birth and development. Notably, one of the main findings of EEG pertains the discovering of the role of spinoffs – thus, the creation of new firms by actors previously employed in same or similar activities- for the growth of industrial clusters. Following an EEG perspective, it is, in fact, exactly through the phenomenon of industrial spinoff that the majority of industrial clusters progressively emerge, endogenously, from the economic landscape (Klepper, 2002; Boschma and Wenting, 2007; Boschma and Ledder, 2010). In a situation of open Windows Of Locational Opportunity - when the arrival of an innovation creates the necessary conditions for a potential break with the past - it has been observed how agglomerations of industries, tend to start from one or few activities which locate (or are already located) on the territory (Boschma and Van der Knaap, 1999). In this sense, a cluster might develop in different manners and, thereby, move into various possible path of development depending from the characteristics and number of the first pioneering industrial settlements (Bellussi and Sedita, 2009): whenever a cluster develops from previous related activities present in the region

[25]The work of Fornhal et al. (2010) focusses precisely on the issue of clusters' emergence by using the insights of EEG. Through various case studies, the book explores what are the possible triggers externalities and growth patterns, which are associated to early stages of clusters emergence. Scholars pointed out that, due to the difficulty encountered in the empirical grasping of currently emerging clusters the focus of research should be oriented toward a variety of methodologies, rather than a single light-shading theory particularly for what concerns the realm of policy application (Menzel et al., 2010).

(ancient tradition or endowments), and expand afterward through a "spread formation", thus, witnessing the emergence of a first small group of firms on territory, which consequently expands in a larger number. If, instead, the creation of the cluster is attributable to a particularly strong single firm (particularly innovative by its own initiative, or because migrated from another context and, therefore, provided with new valuable knowledge), which functions as a growth pole, and gives origins to a series of other firms, then, in this case, the cluster would be characterized by a "concentrated formation".[26]

In both cases, however, the process which scholars have recognized to be crucial for the growth of a cluster is the same: the birth of a multitude of "daughter" spinoff firms from (one ore some) incumbent "parent" firms on the territory (Arthur, 1995; Klepper, 2002; Koster, 2006). Through complex mechanisms, which scholars are still attempting to clarify[27], existing firms spawn other firms (spinoffs), which tend to relocate successively on the territory, in the vicinity of their parents. The reproduction of firms, however is not conceived as a mere iso-multiplication of already existent firms in the economic landscape, but follows criteria linked with knowledge and performance of the firms themselves (Boschma, 2007). Most successful firms are likely to spawn more spinoffs, which, in the phase of selection, are in their turn advantaged by fitter routines and inherited knowledge (Klepper, 2002, 2007; Klepper and Sleeper, 2005; Agarwal et al., 2004). This reproduction has strong implications for the economic landscape since it takes place prominently with a local bias. As demonstrated by many researches, in fact, especially spin-off entrepreneurs tend to start their activity in the vicinity of the firm in which they were formerly employed, this for many different reasons (see Jacobs, 1969; Schamp, 2000; Figueiredo, 2002; Sorenson, 2003; Stam, 2010; Buenstorf and Klepper, 2009; Dahl et al. 2010). According to Stam (2010), the motivations of such strong local bias might be, in effect, of various nature, however, what he claims is that they are to be found prominently in the backgrounds of the entrepreneurs themselves, who are often bounded to their territory by various factors, such as: the presence of an already existent local networks for (or not for) business; more security for their new start-up, since they can

[26]It might be observed how, the emergence of a cluster through the process of spread formation is the one more associated with the already explained concepts of relatedness and regional branching. Examples of clusters emerged by spread formation are the one of the automobile industry (Boschma and Wenting, 2007). Some of the most famous clusters, like Silicon Valley or Detroit are, instead, the result of an external firm's settlement (Klepper, 2010). As we will see, the latter is also the case of Castel Gofferdo, the case study of this research.

[27]The dynamics at the base of spinoff generation are alleged to be many. A seminal paper of Klepper and Thompson (2010) attempted to discover these dynamics, suggesting that more successful and grown firms might be more inclined in the generation of spinoff for simple reasons (as for example the major number of employees which can leave the firm) or more complex reasons (such as the different perception concerning the potential usefulness of the acquired knowledge which leads more employees to try for their own fortune).
Yetthe real reasons leading to the departure of some employees from their employing firm are a recent argument of debate in EEG, which probably deserves to be studied more in depth (Dahl et al., 2010). Other studies linked with the work of Fornhal et al. (2010) have also attempted to give articulated answers concerning the creation of spin-offs: Patton and Kennedy (2010) linked it to a particular industrial environment, while Menzel (2010) ascribes it to the concept of regional learning.

begin with initial part-time efforts, working at the same time in their previous occupation, and continue only in case of successful activity; and last, but not least, aspects directly deriving from the entrepreneurs personal life – as for example the will to remain next to the their own families -. Although also a feeble clustering presence might already have some "gravitational" agglomeration power in attracting start-ups (Suire and Vicente, 2009), this often happens when the cluster has already acquired a minimum of size and reputation, right before the growth phase. Therefore, it has been recognized by scholars, that many clusters would probably have never emerged without extensive spinoff processes (Klepper, 2007; Boschma and Wenting, 2007, Dahl et al. 2010) especially when evolving from one single firm into a massive industrial cluster (Bellussi and Sedita, 2009; Klepper, 2010). This arguments, besides being eye opening for what concerns the dynamics of cluster creation, stress the striking evidence that also the processes leading to the formation of industrial clusters should not be regarded as a mere "sum of rational choices" of agents. Rather, industrial clusters are themselves the result of what could be literally defined a "myopic behavior" of the economic actors (Maskell and Malmberg, 2007), who attempt to make, the most advantageous and satisfying (but not rational) choices time by time, constantly constrained by their situation, assumptions and actual knowledge.

Lock-in, knowledge transmission and dynamics of renewal

The multitude of organizations, firms, institutions, and networks, which arise with the growing number of firms, contributes to create, in time, a collective, complex and plural reality, thus, the industrial cluster. Once a cluster undertakes its growth phase, usually a period of stabilization occurs, in which competences networks and routines progressively crystallize in favour of ("myopically") chosen trajectories. However, it as also long been observed how, in the long run, the situation might also become, for many reasons "over-embedded" (Uzzi, 1997; Martin and Sunley, 2006;Weterings and Boschma, 2006) and in need of new innovations in order to escape stagnation.

On the one hand, through the spin-off process, the gradual specialization of firms, organizations and institutions helps the cluster to acquire a definite shape and identity. Precisely, the specificity and efficiency of the sector of production is refined by the selection of successful firms with their routines, which, in turn, become progressively more competitive between each other, and on the global economic landscape[28]. In time, co-location

[28]It is interesting to note that this studies have also widely contested the long gushed over perspective which sees clusters has ideal and cozy incubators for new firms' startups. The environment of clusters, in fact, also during growing phases, is seen as characterized by high turbulence rates, with the number of exits almost matching the

becomes beneficial for performance, since fostering continuous observation and interaction between firms, both among horizontal and vertical relations. Thus giving de facto the bases for a spatial-technological collective learning (Dahl and Pedersen, 2002; Maskell and Lorenzen, 2004; Bathelt and Gluckler, 2011). Also, it is often only when the cluster acquires a certain degree of self-consciousness and identity that processes like institutions and R&D building start. On the other hand, however, "the success carries with it the seeds of future destruction" (Maskell and Malmberg, 2007, p. 613), in the sense that: the choosing of a path, instead of another, straightforwardly restricts the generic possibilities and flexibility in view of other alternatives of development. In this regard, studies about old industrial areas (Hassink and Shin, 2005; Hassink, 2010; Trippl and Otto, 2009) suggest that, often, are the very same factors which have permitted the flourishing of a cluster which are likely to become, later on, the causes of its economic fade (and crumble in the worst cases). Whenever challenges are presented in the long term – and this might take shape in the emergence of rival markets, or in obsolescence of the sector of production, or again, in a crisis affecting the overall economy of the region - an over connectedness and overspecialization tend to lead a cluster toward a reduced variety, and, therefore, toward an increased vulnerability (Ghraber, 1993; Maskell and Malmeberg, 2007). Clusters with a consolidated tradition in a particular type of production often struggle about finding their way to renewal since, as mentioned previously, new paths of innovation often require to develop, for their implementation, new technologies and/or organizational frames (Boschma, 2007). In short, sooner or later clusters might run into what evolutionary scholars have identified as "lock-ins" phenomena, thus, situations in which the current establishment, at different levels, might become a substantial obstacle for innovation in itself[29].

When such situations occur, regions and clusters might have different methods to avoid decline, and this much depending from their adaptability in face of challenges (Simmie and Martin, 2010). However, since some type of solutions might be only a temporary panacea[30], what evolutionary scholars have recognized crucial, in order to avoid staticity, are the chances for innovation and re-organization driven by the circulation of knowledge, which could effectively lead congested clusters or regions toward a possible renewal (Hassink, 2010). In

number of entries and with a particularly high "infant mortality" of recent entrants (Heebels and Boschma, 2011). Thus, clusters would appear to be prominently selective and ruthless - rather than the alleged nursery environments – in respect to newly entered firms.

[29]The concept of regional lock-in is one of the main topics of EEG's literature and in economic geography, it was firstly introduced by Grabher (1993). Subsequently, the concept was widely discussed during the previous decade, both in theoretical studies (Martin and Sunley, 2006; Hassink, 2005; Boschma, 2005; Hodson, 2008; Hassink, 2010) and empirical and policy-oriented research (Hassink and Shin, 2005; Schamp, 2005; Wenting and Frenken, 2007; Trippl and Otto, 2009). As mentioned previously, recent studies about path-dependence are trying to move beyond the conception of stasis, and are trying to give a more dynamic perspective also to the concept of lock-in (Martin, 2010).

[30]As, for example, the direct financial help from regional or national governments.

this regard, resources and opportunities might more or less be present within or outside the economic landscapes in needs of change.

As already discussed, clusters and firms might benefit in first instance from knowledge resources endogenous to their local contingent economic landscape. This might happen when, within the same region, there is some room for (both formal or informal) exchange between different types of knowledge, routines and technology, all of which might be present in firms belonging to the same or sufficiently related sectors of production (related variety and regional branching) (Asheim et al., 2011)[31].In such perspective, besides the efforts made by R&D facilities and local institutions, cluster's renewal might still be largely conditioned from path-dependent processes,which are, in a sense, partly beyond the mere strategic and planned action. The very same process of spinoff, accompanied by a process of regional learning (Menzel, 2010), could help to differentiate a cluster in the long run, this underpinned by the fact that new generations of entrepreneurs, whit peculiar skills, might start their activity with much more ease in a new,but related, field of industry (Boschma and Wenting, 2006). Other factors, like for example the one labour mobility, are also to be taken into account for the spreading of innovations, since the shift of skilled employees, with their baggage of knowledge, from a firm (or sector) to another might enhance the probability of fruitful spillovers occurring – this also considering that job mobility is likely to happen frequently in the environment of clusters – (see Boschma et al. 2009).

However, wheneverthe case is the one of a particularly strong lock-in affecting the environment of a region/cluster, the situation might become so asphyctic and cognitively static that innovations struggle to emerge, endogenously, from an economic landscape which became to uniform and non stimulating. It might become convenient, then, for the actors of a cluster also to look explicitly for knowledge sources and opportunities external to their contexts. For this purpose, scholars have made a neat distinction between "buzzs" and "pipelines" of knowledge as useful means for the renewal of industrial agglomerations. While knowledge buzzs are mostly unintended and tend to spread knowledge also in an informal manner, in either a local or a global context – hence the concept of buzz resemble more the ordinary notion of spillover but with an emphasis on social relations (Bathelt, 2008) -, pipelines are instead planned and necessitate an interest and an effort between the parties and the actors involved for their fruitful establishment (Bathelt and Gluckler, 2011). Cluster's buzz in this sense are alleged to be more frequent on the local scale since they are largely

[31]The importance of relatedness has already been discussed in the previous sessions of this report. Starting from thier own incumbent endowments and competences and through self-organized bottom-up processes, clusters and regions might be able to slowly reinvent themselves (Garnsey et al., 2010). The renewal is thus achieved by branching from one sector of production to another more spontaneously, and without massive helps in terms of policies (Hausmann and Klinger, 2007; Neffke et al., 2009; Asheim et al., 2011).

dependent on the extent to which actors share, for example, same routines, competences or socio-cultural environment (Maskell and Malmberg, 2007). This is not to say, however, that a buzz cannot occur beyond the limits of a cluster, in fact, useful knowledge might also be acquired, by fortune, also in external context – in this case, low spatial transition costs could also facilitate the relations with other world regions, and firms would be more prone to receive growth triggers from outside - (Bathelt and Glucker, 2011). Global pipelines, by their side, are explicitly aimed to seek and constantly acquire knowledge from external pools, for this reason they are not describable as simple accidental events. Formally planned and stable linkages between organizations, pipelines are alleged to lead to frequent face-to-face contact and longer time confrontation between the economic actors involved, thus, with a major leverage also in terms of knowledge exchange. More durable linkages, however, often necessitate, for their accomplishment, also the overcoming of cognitive, organizational, cultural and institutional distances (Boschma, 2005, Bathelt and Gluckler, 2011). For such reasons, all factors contributing to the shrinkage of time/space – like low transaction costs, informatization and eventual meetings/fairs [32]- are, in general terms, alleged to bring some benefits both to the generation of buzzs and pipelines. A relatively networked and mobile context might also cause a potential innovation to literally "bump" into the local economic landscape from the outside. This could happen, for example, with the settlement of anexternal firm attracted by the potential of the cluster, and endowed with a somewhat new and groundbreaking knowledge (Martin and Sunley, 2006; Bellussi and Sedita, 2009; Iammarino and McCann, 2010). However the arrive of a MNC does not always coincide with the renewal of a cluster. However, also in this case, the arrival of a multi national company cannot be associated deterministically with a renewal and change might take place only under certain specific conditions (for discussions see Iammarino and McCann, 2010), also because multinationals (and foreign direct investments, in general) tend to establish in new territories without their research plants (see Simmie and Martin, 2010).

Ultimately, it must be considered that nowadays virtual spaces - like internet - could provide an enlarging and almost omnipresent opportunity of network, through which economic agents are constantly able to keep the pace with latest information in their field (Gertler, 2008; Trippl et al., 2009; Jones et al. 2010; Bathelt and Gluckler, 2011), though with a more or less limited extent.

All in all, it appears that many are the factors and occasions, which could, potentially and inmany times, "give breath" to a situation of regional lock-in and lead congested

[32]The importance of trade fairs as temporary clusters is a topic debated in both evolutionary and relational economic geography (Maskell et al., 2006; Bathelt and Gluckler, 2011). It as been observed how,these kind of collective events, besides being an occasion for the tying of new partnerships (pipelines), are of particular importance for the informal updating of entrepreneurs attending them (buzz).

clusters/regions toward new paths of development. However, what must be considered, in last instance, is that much the success still relies on the specific capabilities of the actors forming a cluster, who must be able to fully appropriate of new knowledge in order to make use of the latter. What has been argued, in fact, is that innovation often follows channels of diffusion, which are hardly comprehensible by stylized models taken alone – as for example, the model of buzz and pipelines (for critics, see works of Gertler and Wolf, 2006; Asheim et al. 2007; Trippl et al., 2009) - and much of the knowledge transferring success depends from processes at a lower level. EEG studies have also firmly suggested that, besides the mere conception of "being there", much of the implementation of new knowledge- and, therefore, innovations - largely depends from the specific economic agents' absorptive capacity (Cohen and Levintal, 1994) and relational proximity in the context of learning processes (Boschma, 2005; Falcounbridge, 2007). It has been observed, especially when considering highly specialized industrial sectors, how knowledge buzzes occur prominently in and through epistemic communities, in their turn formed by a limited number of actors substantially able to interpret, evolve and make use of the knowledge in question (Moodyson, 2008). Innovative knowledge is unlikely to flow smoothly between different economic environments, rather, it relies considerably on figures like cluster's gatekeepers for its transmission (Coe and Bunnel, 2003; Depner and Bathelt, 2003; Giuliani 2005; Morrison, 2008; Bathelt and Gluckler, 2011), thus, agents able to search, transcode and eventually share useful knowledge from a context to another (Morrison, 2008). Leading firms or managers, for example, might become effective gatekeepers only when able to search, transcode and share external knowledge useful to the context of the cluster.Following these assumptions, additional attention has been paid also to the specificity at the micro-level of learning processes, this, for example, depending from the types of knowledge on the territory linked with the innovation in question (Asheim and Gertler, 2005; Asheim et al., 2011)[33].

In last instance, it has been also noted that, even when clusters manage to undertake, effectively, different development trajectories, these might still take different shapes and entity. In this sense, whenever an innovation simply implies a re-discussion of already existent economic or technological cluster's trends, what may occur is a simple phenomenon of cluster adjustment, probably capable to give temporary relieve to the economy, but unable to reverse a permanent situation of cluster decline. A significant change of the actual path of a cluster, thus a renewal, may become a concrete solution to a decline[34]. However, particularly

[33] In their seminal paper, aimed to improve clusters' policies with recent insights in economic geography, Asheim et al. (2011) make a clear dinctintion between three different types of knowledge – namely analytical, synthetic and symbolic- which are likely to play, in turn, an important role, this depending from the sector of production in question.

[34] We are referring here to a certain amount of studies investigating the differences between clusters' adjustment and renewal, starting from concepts like resilience and adaptability. The debate around these concepts has obtained

in this case, in addition to the already discussed challenges, which are likely to be encountered – linked to organization, technology and knowledge capacity-, also issues linked with institutions and power must play a determinant role for this eventual radical change (Hassink, 2010).

All in all, it appears that, as for what concerns the dynamics of cluster emergence, as also the ones of cluster renewal remain a complex topic, still deserving a kind of "tailored-on" approach for each case for a better comprehension – and this especially for what concerns the policies which must eventually be applied - (Asheim et al. 2011). In regard of these issues, EEG is constantly making its progresses also by involving insights from other paradigms and frontiers of research are kept in this sense widely open.

Clusters through an historical and dynamic perspective of development

In previous sessions we have discussed the new insights brought by EEG to the field of economic geography and in particular to the study of economic regions and industrial clusters. As observed, due to the high complexity and unpredictability of the economic landscape, it is still difficult (if not impossible) to forge an all-comprehensive theory, which can become panacea for all the cases studied. Especially when it comes to the predictability of emergence and renewal of clusters. What is, however, really innovative of EEG, is the introduction of the concept of history as valid tool of analysis for the spatial economic landscape. The process of agglomeration in clusters and regions is not meant as a mere movement of actors toward balance and equilibrium, but is understood as a phenomenon strictly linked to a spatial and - even more- temporal dimension (Boschma and Martin, 2010). Explanations about the emergence, sustainment and eventual decline of economic agglomerations might be given from an a posteriori perspective, thus, by literally unfolding the historical processes and facts responsible for the shaping of the economic landscape in question. It might be observed how previously described EEG's concepts –Thus, spinoff processes, selection and diffusion of new knowledge and routines, etc. - are in themselves notions strictly linked with a continuative conception of temporality and are, therefore, only understandable through a non-static analysis and "in-time-unfolding" oriented perspective. Following these assumptions, it could be clearly stated that EEG studies industrial agglomerations, regions and clusters as complex, plural and constantly evolving entities, but conditioned at every moment by their past (Boschma and Martin, 2010). In this sense, the

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some attention in social sciences and economic geography (see for example Chapman et al. 2004; Swanstrom, 2008; Simmie and Martin, 2010; Pike et al., 2010; Hassink, 2010 res) and will be also revisited further, in the next sessions of this report.

study of clusters is undertaken following the whole historical sequence of time. Thus, giving a sort of dynamic and continuative "movie perspective" of the entire development of clusters instead of an analysis based on detached moments. By interpreting the economic landscape as a essentially complex system, this kind of approach also tries to rule out, as much as possible, any kind of notion based on equilibrium analysis. EEG claims in fact, that: economic systems, like clusters and regions, besides being prone to external shocks and changes from the outside, are also largely affected by processes, which take place within their spatial reality, and which see a constantly an incremental change driven by the creation acquisition and commercial exploitation of new knowledge by firms, organizations and institutions, endogenous to the cluster/region in question. Thus, the central claim is again that, also when apparently stable (or locked-in), economic landscapes are continuously changing from within, but without never achieving, at any level, a situation of stability (Boschma and Martin, 2010; Simmie and Martin, 2010; Staber, 2010)

To summarize, from an EEG perspective, "clusters emerge due to well performing spinoffs coming from a selected number of successful parents" and "the role of localization economies in this process is limited, at best" (Boschma and Frenken, 2011, p. 5). Besides, the attachment of entrepreneurs to their forming environment plays an important spatial role in the process. These findings do not only fit with the EEG's assumption that industrial clusters are essentially the reproduction of alleged advantageous routines in the economic landscape (Maskell and Malmberg, 2007), but it is also in line with what EEG supports in matters of relatedness. In fact, since firms' pre-entry experience, influences positively their survivability in the economic landscape, it might be observed how - in absence of a proper anchor firm starting the process - first successful entrants, "founding ancestors" of the cluster, are often spinoff firms of an industry some way related in technology with the incoming one (Boschma and Wenting, 2007). This processes lead, in time, to the to progressive specialization of a cluster which, sooner or later, will have to face challenges linked to the renewal of its knowledge base and routines. Thus, this process resembling a sort of "life-cycle".

As we will discuss, a unique concept the probably condenses in itself many of the findings of EEG is exactly the one of cluster life cycle. A life-cycle perspective permits, in fact, to analyze a cluster not only by taking into account different steps, but also by giving a deeper understanding of the whole process which have contributed, in time, to the creation of the cluster itself. This concept will be introduced in the next sessions of this report.

3.2.1 The concept(s) of cluster life-cycle.

Akin to the notions of evolution, history and path-dependence (Martin and Sunley, 2006) in economic geography, and encompassing most of the innovative concepts of the EEG paradigm, is the concept of 'cluster life-cycle'. Borrowed from the field of natural sciences, the concept of life cycle has been taken up and re-adapted by several social scientists and, in recent years, EEG scholars in particular, have employed this concept in order to shed light on processes determining the birth, development and changes of clusters over time (Audresch and Feldman, 1996; Pouder and St. John, 1996; Brenner, 2004; Buenstorf and Klepper, 2005; Lorenzen, 2005; Maskell and Kebir, 2005; Zucchella, 2006; Maskell and Malmberg, 2007; Bergman, 2008; Menzel and Fornhal, 2009; Hassink, 2010b).

It must be noted that the concept of life cycle was not new to the field of social sciences and economics, before the insights of EEG, in fact cycles have been widely discussed by many scholars in terms of industrial life cycles (Storper, 1986) possible lock-ins over time (Graber, 1993) and cluster competition (Porter, 1998)[35]. However, as also already discussed in the previous sections of this paper, the majority of the studies conducted on clusters mainly focused their efforts on explaining their function in relation to their alleged advantages for regional economics, with less regard about their history, processes of emergence and specific development. Particularly, not great attention was paid, until recent decades, to the evident phenomenon of 'ageing process' which was observed affecting many clusters. It was proven, in fact, by researches on cluster dynamics, how external firms where eventually outperforming in terms of success and innovation the clustered ones in the long term (Pouder and St. John, 1996) and how the stories celebrating success of clusters were temporary, especially when considering different stages of cluster development process (Van Klink and De Langen, 2001).

In this regard, the concept of cluster life cycle was adopted, as a stylized metaphor and composite theoretical notion, in many EEG researches in order to give a more precise and stylized theoretical framework to the transformations of economic landscapes over time, with particular attention to the notions of history, heredity and path-dependence (Martin and Sunley, 2011). As a common point, many EEG studies tend to demonstrate that industrial clusters and agglomerations are constantly challenged to evolve over time, often following an itinerary of life stages similar to the one of biologic organisms (notably: birth, growth, maturity, decline and eventual death)(Menzel and Fornahl, 2009). However, still within the field of EEG, a variety of different approaches emerged in respect to the concept and,

[35] Martin and Sunley (2011) argued that the concept of life-cycle could be seen stemming from the the early 1950 when it was introduced in the economic landscape with regard to market sale products' stages.

although with similar purposes, scholars studied clusters' life cycle through the assumption of different research perspectives and different methods, evidencing sometimes more quantitative, sometimes more qualitative aspects of life cycle stages (Bergman, 2008; Menzel and Fornhal, 2009).[36]

It is certain that a major contribution to the concept of clusters' evolutionary life cycle in EEG comes from the theories investigating the "demographic and ecological" aspects of firms' location (the already mentioned Generalized Darwinism). These studies, especially concerned with quantitative dimension of clusters, focussed primary on the processes and dynamics responsible for the variation in the population of firms within space (Arthur, 1994; Klepper, 2001; Swann, 2002; Maggioni, 2005; Bottazzi et al., 2007). It is explained in such models, with stylized facts, how spatial concentration of firms occurs, starting from an embryonic situation, in different stages of development. In the growing stage of a cluster, the number of firms is seen first increasing sharply, due to Windows of Locational Opportunity mechanisms (Tyre and Orlikowski, 1994; Boschma and Van der Knaap, 1999, Boschma, 2007) pervasive spin offs (Feldman et al., 2005; Klepper, 2007, Boschma and Wenting, 2007) and growing attractiveness in the reputation of the cluster itself (Suire and Vicente, 2009), then, immediately later, progressively decreasing and stabilizing due to shakeouts targeting companies which are not able to pass the "selection''. In second instance, the evidence is that, after the growth, the majority of clusters tend to follow a phase of stabilization, which sees a decrease in both the rate of birth and cessation of companies, with a crystallization of successful routines. All this mechanisms generally contribute to give a more clear specialization and visible identity of the cluster (Klepper, 2007; Malmberg and Maskell, 2010). It has also been observed that in case of decline the number of firms could decrease until the cluster tend to disappear (Grabher, 1993).

In addition to quantitative dimensions in the number of entrants and exits, EEG research paid particular attention also to qualitative changes occurring within industrial clusters in different stages of evolution. In fact, it was observed by scholars that stages of cluster life-cycle were not only characterized by a mere oscillation in the population of firms, but exhibited particular characteristics considering: knowledge share and creation, relationship with institutions, mechanisms of renewal and networks of firms (Bathelt et al., 2004; Maskell and Malmberg, 2007; Glucker, 2007; Ter Wal and Boschma, 2007). Notably, Maskell and Malberg (2007) recognize how the process of cluster formation is in itself the result of a sort of "myopia" of bounded rationality which induces entrepreneurs and organizations to set their business in concordance to already known existent successful firms and routines. At

[36] As mentioned before in this research, EEG is a discipline in construction, which favors eclectic position in regard of methodology and general perspective of research (Boschma and Frenken, 2006).

each stage of development the process of myopia enables to build solution and routines using already present knowledge of the actors, but at the same time it is seen increasing the specialization of the system in general, precluding other sets of solution. Another important contribution, in this sense, has been given by Bellussi and Sedita (2009) - and later by Elola et al., (2012) in the Basque context - , who, by drawing from the work of Martin and Sunley (2006), attempted to clarify, with an analysis of twelve Italian Districts, the mechanisms of cluster emergence and development in stages. In doing so, they developed a meta-model based on "multiple path dependence" and focused their attention on the endogenous/exogenous "triggering factors" responsible of clusters' emergence and particular type of evolutionary cycle undertaken. In this regard an approach based on triggering factors tend more to focus on the dynamics bringing to the transition in stages instead than digging deep in the characteristics of the latters.

Considering EEG's previous research on the topic, it should be noted that it might be difficult, due to the heterogeneity of the approaches and methodologies employed to trace a more specific and precise picture of what is intended for industrial cluster life cycle. Seminal, in this sense have been the relatively recent contributions of Menzel and Fornahl (2009) and Martin and Sunley (2011), who attempted to give a more concrete and systematic (but at the same time flexible) perspective about the concept of cluster life cycle[37]. Menzel and Fornhal, in their article about clusters' dimension and rationales, discuss how each singular phase of cluster life cycle is not only marked by qualitative and quantitative aspects, but also by a peculiar systemic dimensions[38]. In this regard, after having built a clear frame of cluster life cycle stages, with dimensions and rationales explained (see *Figure 1*), scholars argue that, in addition to the number of firms, much of the cluster development and success depends from the capacity of maintaining knowledge heterogeneity and technological renewal.

[37] Even though if Maskell and Kebir (2005) and Bergman (2008) had already attempted a review of various life-cycle perspective.

[38]Following Menzel and Fornahl, in systemic dimensions are included those effects not strictly related with the ''material entity'' of the clusters but, rather, with qulitative processes taking place because of their presence inside and outside them. In this, regard they seem to feed the idea of Porter (1998) that "a cluster it is more than the sum of its parts"(Porter, 1998)

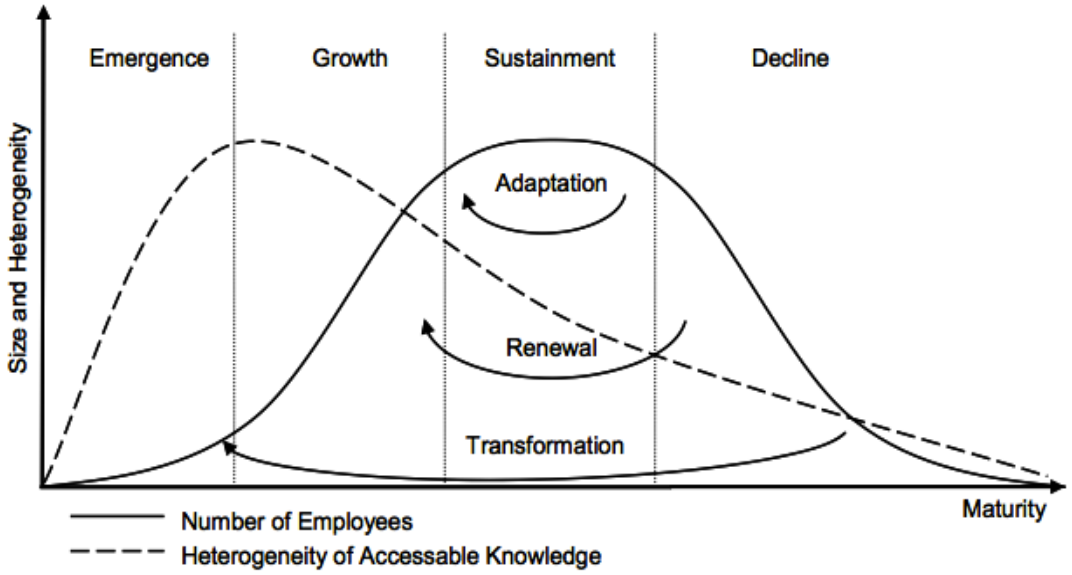


Figure 1: Stylized trajectory of a cluster life-cycle following Menzel and Fornahl (2009)

Thus, after having set a clear model of cluster life cycle analysis, Menzel and Fornal explain how clusters' life cycle differs from the cycle of the respective industry, concluding that qualitative measures should be enhanced for the study of clusters' systemic dimensions and promoting heterogeneity of research (since each one of the four dimensions investigated requires different method of research) (Menzel and Fornhal, 2009). Therefore, insights from the work of Menzel and Fornahal have been later applied in researches like the one of Kholer and Otto (2008)[39] investigating the role of new entrants firms in three districts in Germany, or Ter Wal and Boschma (2009) focussing on co-evolutionary patterns during the evolution of clusters. Depending from the particular stage in which a determinate cluster rests, a life cycle framework suggests a different policy approach aimed to renewal and rejuvenation (Hassink, 2010b; Brenner and Schlump, 2011)

Yet, also the models above presented might show certain limitations (Martin and Sunley, 2011). While "districts (hence, clusters) do indeed often follow an evolutionary path from infancy to a growth phase, followed in turn by maturity and subsequent stages of stagnation and decline or revitalization" (Bellussi and Sedita, 2009, p. 509), when considering the results given by evolutionary studies it could be observed that only a few of them generally follow a complete "canonical" stylized life-cycle as in conceptual literature, tracing instead their peculiar own trajectory (Martin and Sunley, 2006; Shin and Hassink, 2011). Besides, it was demonstrated, that many clusters were able to renew or delay their decline maintaining

[39]In such regards, the article of Kholer and Otto used, as framework, the former article of Menzel and Fornhal published in 2005 and not yet translated in English.

leading positions for long periods (Grabher and Stark, 1997; Bresnahan et ali., 2001) or, in some cases, face a premature death even before their growth (Orsenigo, 2001)[40]. In addition, not much attention is paid by the model to the modalities of renewal of clusters, which can range from the mere upgrade of a product (Tappi, 2005) to the very change of the entire regional specialization asset (Christopherson, 2009). In sum, the notion of life cycle, based on emergence, growth, sustainment and decline appears not completely satisfactory, especially considering industrial clusters themselves as entities hard to grasp (Martin and Sunley, 2003). Therefore a more flexible and comprehensive concept seems to be required.

Adaptive cycle

EEG moves beyond the conventional concept of cluster life cycle with the recent article of Martin and Sunley (2011), who suggest a change of perspective in the study of clusters' evolution through the revised approach of "adaptive cycle". The concept of adaptive cycle has been recently introduced in the environments of EEG. It derives from the work on regional analysis of Pendall et al. (2009) and is part of a wider discourse aimed to enrich the recently developed paradigm with supplementary theoretical supports from the realm of complexity thinking[41]. Precisely, it tries to give additional dynamicity to the "traditional" model of cluster life-cycle by starting from the original EEG's assumption that economic landscapes are hardly understandable as static and equilibrium oriented systems, but should be rather interpreted as continuously changing complex entities in constant adaptation (Martin, 2010, Simmie and Martin, 2010; Pike et al., 2010, Shin and Hassink, 2011).

The theory of adaptive cycle draws its insights from the revisited concepts of regional resilience, adaptability and panarchy, configured into the perspective of EEG (Simmie and Martin, 2010). Following various previous contributions about the importance of regional resilience and connectedness (Maskell and Malmberg, 2007; Foster, 2007; Pendall et al, 2007; Hill et al., 2008; Swantrom, 2008), Simmie and Martin (and later Martin and Sunley) firstly developed a conceptual framework in which resilience and connectedness of systems are analysed as rather complex processes. Hence, they propose an alternative view of

[40] It must be appointed that also Menzel and Fornhal (2009, pg. 219), in an explanation of one of their article's scheme, already noted that "the development of the cluster is not a deterministic move from left to right", rather a continuous process of adaptation. Yet, it could be argued that, they tended to discuss agency, heterogeneity and contingency as elements only deviating from the "orthodox" conventional life cycle path.

[41] As said, complexity theory is the third and probably, till now, less discussed theoretical basement of EEG. In recent years, and mainly through the contributions of Ron Martin and Peter Sunley, the scope of this research as been enlarged with the implementation of appealing concepts partly linked with each other such as self-organzation and emergence (Martin and Sunley, 2007; Martin and Sunley, 2011) revisited dynamicity and path-dependence (Simmie et al., 2008; Martin and Sunley, 2010; Martin, 2010) and investigations of concepts, like the one of life cycle, based on adaptive resilience and hysteresis (Simmie and Martin, 2010; Martin and Sunley, 2011; Martin, 2012).

regional/cluster development by dividing the life cycle in four stages (in many regards similar to the ones of traditional life cycle), notably: reorganization, exploitation, conservation and release. Mainly based on descriptive methods, the purpose of this framework is aimed to demonstrate that, rather than a linear growth from emergence to decline, clusters are likely to follow a more or less circular, sequential and "restless" development, at every time "increasingly driven by the creation, acquisition and commercial exploitation of new knowledge" (Simmie and Martin, 2010, p. 41). Thereby, each phase of clusters' (adaptive) life cycle is characterized by different degrees of resilience, adaptability and connectedness, but without situations of real stabilization or reaching of equilibrium within the different periods. Moreover, what has been observed is that the stages of development do not always follow a regular sequence of progression, but could eventually shift from one situation to a completely different one in a relatively small amount of time, thus crossing intermediate landmarks[42]. The authors also state that much of this uncertainty and complexity is generated by the fact that micro and macro levels are constantly affecting each other during the whole cycle – but, still respecting the EEG's notion that sees micro structure playing a more prominent role during release-reorganization phases and institutions during conservation.To continue further, Martin and Sunley (2011) underpinned that, although frequently employed, the metaphor of life cycle could cause problems if directly implemented in the context of clusters, since the latters are better defined as systems of co-evolution and self-organization based on a multitude of factors and interdependences, rather than clear seized geographical entities. In other words, they support that cluster could be classified to all the effects as complex systems, thus, hardly describable with notions like "ideal" or "normal" (Martin and Sunley, 2011). Therefore, starting from previous works on complex systems' in evolutionary ecology (Cumming and Collier, 2005; Gunderson and Holling, 2002), Martin and Sunley argue that, the meta-model of adaptive cycle, with its three dimensions of capital accumulation, resilience and connectedness, which alternates in in four moments of developments, is probably the best suited to describe in general clusters' evolution which results cyclical rather than linear. Hence, they contend that the complexity of clusters' evolution should be studied taking more into account factors like unpredictability and the role of agency. For this reasons, the researchers propose again the model of adaptive cycle modified with six additional possible evolutionary trajectories (see *Figure 2*), which are likely to be observed in clusters, in addition to the mere process of emergence, growth, maturation

[42]What is evident, for example, from Simmie and Martin's research, is that the successful conservation phase of Cambridge high-tech cluster cannot be described only as a period of stasis, in which factors like production and employment remain more or less steady. Rather the process of conservation is seen as a continuous branching within the knowledge platform, grounded in advanced mathematics and computing. The emerging of new sectors from a diffused base of advanced knowledge, is accompanied by a constant turnover in the population of firms, which does not remain steady. In the case of Swansea, instead, it is possible observe that the region passes from the phase of exploitation to the one of release,without passing through a conservation phase at all.

and decline, notably: full adaptive cycle, constant mutation, stabilization, re-orientation, failure and disappearance.

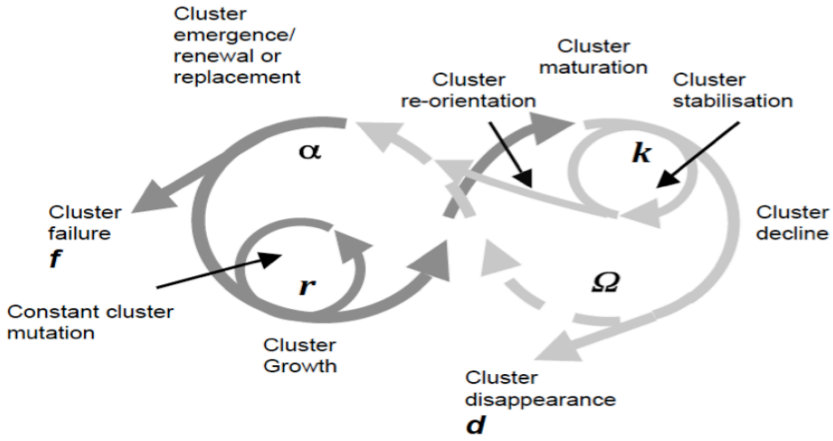


Figure 2: Clusters' possible alternative trajectories proposed by Martin and Sunley (2011), following an ecological/adaptive perspective.

Also depending from the kind of their industry and specificity, different clusters are argued to embrace different ways of evolution. Thus, while clusters of high-tech products are often seen in a continuous process of mutation, some others, based on lower types of technologies (as for example many Italian districts), tend to exhibit a more stable pattern of evolution especially in terms of specialization. However, Martin and Sunley also conclude by stressing their scepticism in matters of universal models of clusters' development and affirm that still further research is needed in regard of both life and adaptive cycle.

In second instance, however, it has been argued that, if on the one hand adaptive cycle approach effectively allows for more flexibility in the interpretation of economic landscapes' development, on the other hand, it also introduces not unambiguous notions such as the one of resilience (Hassink, 2010b). Moreover,it reduces the frameworks' reliability and explanatory power, leading de facto to "the risk of coming out with as many trajectories of clusters as there are clusters" (Boschma and Fornahl, 2011, p. 3).

Historical changing dimensions: heterogeneity, connectivity and resilience

In addition to deal with the division in stages of the process of evolution recent theoretical insights on clusters' cycle have also attempted to discuss deeper the role covered by history in the development of clusters. Precisely, it has been discussed the ageing process affecting the majority of regions and economic agglomerations particularly with an eye to stylized

facts.Three theoretical concepts are highlighted by the literature of life and adaptive cycle in relation to the historical development of industrial clusters, namely: heterogeneity, connectivity (networks) and resilience - the latter considered mainly bythe framework of adaptive cycle. According to stylized notions on clusters' evolution, the above mentioned are concepts of economic systems, likely to vary depending from the incumbent, but temporary, characteristics of the latters. In other words, heterogeneity, connectivity and resilience are dimensions of change, alleged to be strongly dependent from the particular phase of development experienced by a cluster, which determine at the same time its evolution. Moreover, such dimensions have not been conceived as freestanding and separate, but likely to affect deeply each other's entities.

To begin with, the concept of *heterogeneity*, has enjoyed particular attention in EEG and consequently in life cycle theories. In broad terms, it is strongly associated with the degree of diversity and variety of economic activities present in a determinate region or cluster and, nonetheless, with availability and accessibility of valuable knowledge within geographical economic landscapes (see also the previous sessions of this research). Precisely, studies on clusters' life cycle have evidenced how, after their birth, clusters tend progressively to narrow their industrial trajectory in order to better exploit the benefits from most profitable productions, fitter routines, and increasingly more specific knowledge (Menzel and Fornhal, 2009). As already discussed, however, it has been observed how the focussing of a cluster on a particular strand of industry almost inevitably comes at a cost, since one path is chosen instead of another, therefore reducing the effective heterogeneity of the system. Following stylized facts, in first stages of a cluster development, variety is likely to be higher among firms, along with the uncertainty of "best choices" to be undertaken in terms of a more specific sector of business. The heterogeneity of a cluster normally starts to decrease immediately in the growth phase, when a narrower thematic industrial boundary is selected and knowledge becomes more codified and available. The increase in the number of firms – mainly through processes of spin-off and imitation- is, in turn, followed by a crystallization of fitter routines and competences inherent to the economic thematic chosen. Still considering stylized facts of cluster evolution, in later stages of clusters' development heterogeneity further decreases if firms are not able to renew significantly their knowledge base and no radical innovations are introduced and exploited (Menzel and Fornhal, 2009). Eventually, and excessive rigidifying of diffused competences and knowledge bases, are associated with a lowered heterogeneity, and might lead clusters in the direction of so-called cognitive-lock-ins: thus, situations in which the actors forming a cluster are not able to renew themselves -and their businesses- due to a lack of capacities, possibilities and horizons in respect of more promising trajectories (Grabher, 1993). For this reason, EEG scholars have discussed the

importance, for regions as well as clusters, of maintaining a certain degree of variety and differentiated knowledge bases within their economic landscapes in order to be more adaptable and less vulnerable in face of external shocks (Asheim et al. 2011). The literature on clusters' evolution also evidenced how this temporal decrease of heterogeneity is likely to vary depending from nature of the thematic industrial boundary itself. For example, while clusters based on high technology and analytical knowledge are advantaged in maintaining higher their level of heterogeneity, since innovation more or less continuously occurs also at the micro-level of firms - thus firms might shift with relative ease into new promising cutting-edge productions- (Martin and Sunley, 2011), on the contrary, "homogenous and narrowly based economies with ignorant and incapable economic actors suggest weak adaptive capacity" (Pike et al. 2010, p.65), and more inclination toward the maintaining of the status quo despite imminent declines. Finally, still according to stylized facts, the degree of heterogeneity of a geographic economic system is largely influenced also by how much organisations are connected and interdependent between each other. In this sense, studies have emphasised the role of networks and connectedness in relation to heterogeneity, especially for what concern the study of old industrial areas, where the high embeddedness of entrepreneurial and institutional organisations -both narrowly focussed and myopic- often results in an exhausted trajectory of the industrial thematic boundary and a perpetrated incremental innovation, unable to solve situations of stagnation or decline (Grabher, 1993; Maskell and Malmberg, 2007; Hassink, 2010).

A second dimension, strictly related to diversity of knowledge and variety of the industrial theme, is therefore, the dimension of *connectivity* and *networks* in industrial clusters. As previously mentioned, a consistent part of EEG's literature focussed on the importance of interaction's dynamics in agglomeration of firms. In this regard, it has been observed how the creation of linkages and interdependencies between organisations is also likely to follow an historical and path-dependent process inherent to the life-cycle of a cluster in question going –inversely- hand in hand with heterogeneity, since "the variety across firms in terms of capabilities drives the evolution of networks through time" (Ter Wal and Boschma, 2009, p.6). It is argued in fact that, even when a multitude of firms rests in the same geographical and industrial thematic boundary, the singular elements forming a cluster might differ significantly in their capabilities, routines and organisation. Economic actors will therefore seek to establish linkages with others in order to enhance their competitive advantage and dynamic capabilities, forming new networks of interaction, of different nature and entity (for example, in the same cluster there might be stronger networks, in which firms concretely exchange information and have deeper dialogues -also with the local institutions- as well as, weaker networks only limited to the interaction for commercial reasons or complementary

functions) (Menzel and Fornhal, 2009). In this sense, the degree of heterogeneity in a cluster is believed to condition significantly the extent to which firms interact during the whole life cycle process, since economic actors tend to establish connections especially with others not too similar but at the same time not too different from them (see previous sessions on proximity). Thus, following the insights of Ter Wal and Boschma, while in introductory stages of cluster life-cycle networks and interdependencies are usually loose and unstable - given the still uncertain and vague nature of the system-, they eventually start to thick already during initial growth stages. Successively, if the cluster manages to undertake an effective maturation -and eventually ends up in a sustainment phase - connections tend to reach their maximum peak and crystallize in a more stable form in a sort of network's lock-in. In this regard, since the interaction usually follows criteria of profitability, firms that, in time, affirm themselves as more prominent in a cluster are also likely to become holders of a major number of connections. Again, networking (as heterogeneity) is a dual-edged sword for clusters: on the one hand a sufficiently networked agglomeration offers much more possibilities for collective action and circulation of information, and this especially if firms are more inclined to exchange knowledge and expertise. Notably, leading firms might undertake important role of vector in the spreading of new knowledge and innovation, given their superior connection with both the internal and external environment of the cluster. On the other hand, a too lengthy, inward and jaded interaction between cluster firms might, in turn, reduce the dimensions of heterogeneity and adaptive capacity of the system. Firstly, too fixed and durable networks in a cluster decrease the possibility for firms to un-engage from current assets and actors become more myopic in respect of new profitable horizons for development; secondly, the breaking of long-standing ties and routines is perceived with major uncertainty from firms, since venturing in a new trajectory usually requires a considerable efforts and risks; thirdly, the prolonged interaction (also unwanted) between different firms, which learn from each other might lead to an homogenisation, in the long term, of their thematic boundary, routines and capabilities – thus, to an overall lowered heterogeneity. In addition, as already argued, such rigidifying of relations does not concern solely the relation between firms and private business operating in a cluster, but likewise involves the entire socio-economic substrate present in the area. Whenever, in fact, an industrial cluster manages to gain sufficient size, visibility and economic power, it often starts to directly interact with regional macrostructures, such as institutions and intermediate of organisations, and due to a mutual interest, the parties tend to adapt and co-evolve, in order to better satisfy the needs of the incumbent industry. However, considerable problems might eventually occur in a situation of crisis of the industrial sector, since the over-embeddedness of firms with social and institutional environments could lead to devastating "political lock-ins", which sees the rise of authentic self-sustaining coalitions defending the declining status

quo and hindering renewal and restructuring (Grabher,1993; Hassink, 2005). It is therefore assumed that a "correct" declining stage of a cluster –thus, without the presence of reiterative and strong lock-ins- should imply the dissolution of previous established network structure in favour of new trajectories, and a return to an unstable situation (Ter Wal and Boschma, 2009), unless, also after its maturation, the system is able to maintain some flexibility also for what concerns the creation of network frame[43]. Considering what explained previously, and given the close relationship between heterogeneity and interaction, the theoretical framework of cluster adaptive cycle (Simmie and Martin, 2010; Martin and Sunley, 2011) has attempted to give a more all-comprising and summarized notion of the two historical dimensions, one unique concept denominated: "connectedness". With connectedness is meant in fact the entire set of traded and untraded independencies between the firms of a cluster (Martin and Sunley, 2011), considering not only the deliberately established networks and connection between actors, but also the degree to which firms and organisations are similar and specific in their competencies and function. In this sense, following adaptive life-cycle, the growing interaction, similarity and co-evolution of economic actors through the life stages of a cluster brings to an increase of the total level of connectedness, which increases the identity, but at the same time lowers the resilience of the system itself.

It is, in fact, the *resilience* of complex systems the third dimension considered in an historical development of clusters. As a theoretical notion, resilience has been only recently conceptualized from a strand of EEG studies oriented to adaptive cycle and it is currently in search of a more solid analytical framework. Briefly, the concept essentially refers to the attitude of complex economic systems (as regions and clusters) to react in face of recessionary shocks and situations of decline. In this regard, given the fuzzy nature of the concept, Martin (2012) evidenced how resilience itself might be interpreted effectively in different manners when considering its entity. Hence, while it is true that economic systems might be differently affected by endogenous or exogenous shocks, and could resist or recover more or less efficiently (and quickly) to these latters, important is also their capacity to re-orient and renew themselves in order to avoid in the future similar crisis, eventually regaining assets equal or improved in respect of the previous ones (Martin, 2012). However, regardless from the aspect taken into account, it is alleged that the overall degree of resilience of a determinate economic system tend to be strongly conditioned by its adaptability, a characteristic in turn related to the levels of heterogeneity and interaction. Thus, considering the historical evolution of clusters, resilience hardly results as steady property, but varies depending from the stage of development and from factors both exogenous and endogenous

[43]In this instance it has for example been discussed "the strength of weak lock-ins" for clusters (Hassink, 2007), thus situations in which the connective assets of a cluster exist without necessary precluding its adaptation.

of the system since the dimension "is not a static feature of an economy, but a dynamic process, influenced by both the both the impact of major shocks and by the ongoing restlessness of structural economic change and adaptation" (Martin, 2012, p. 28). Precisely, according to the stylized framework of adaptive life-cycle, resilience follows a path of evolution "in the middle" in relation to the two other dimensions of heterogeneity and connectivity (see Martin and Sunley, 2011). In fact, it is alleged that resilience starts to increase already during the emergence stages of a clusters,eventually peaking in the phase of growth (a moment in which normally occurs the full exploitation of a new innovation or opportunity, and characterized by exogenous patterns of growing demand). However, right after maturation, processes of decreasing variety, homogenisation, and growing embeddedness (previously discussed) are supposed to decrease considerably the general degree of resilience and adaptability of economic systems in respect of potential recessionary shocks. Therefore a situation of decline (or release, according to the adaptive cycle terminology) might represent an occasion for resilience to grow again, if previous assets are properly, un-locked, re-discussed and re-oriented. In other words, according to the adaptive life-cycle theoretical framework, resilience is always "one step prior" to the current phase of cluster development, and a system is likely to experience a crisis when the levels of this dimension are already lowered. Thus, scholars have recognised the high potential of this notion in terms predictive power for regional and cluster development, in combination with evolution of heterogeneity and networks. Only, resilience is steel a theoretical concept under construction, and since the notion is in itself extremely complex doubts have emerged about the feasibility of its concrete application (Boschma and Martin, 2007; Hassink, 2010b). As explained in previous sessions, it has been observed how the same canonical adaptive cycle is, in effect, too reductive when it comes to interpret the development of the majority of industrial clusters, since resilience is likely to vary depending from the multitude of paths or trajectories that could be undertaken, depending from the peculiar nature of economic systems (Martin, 2010; Martin and Sunley, 2011). In addition, as pointed out by Pike et al. (2010), the study of industrial clusters' and resilience should not rule out too soon the role played by other contextual elements like importance of agency and political, institutional or sociocultural aspects,factors to which no cluster is de facto completely extraneous or independent.

In sum, what appears clear is that heterogeneity, networks and resilience are three different - but at the same time strongly related - concepts, linked with the historical development of economic landscapes. Thus, after having reviewed briefly the three dimensions with their characteristics, in *Figure 3* we attempted a schematisation of the trends followed by these latters according to stylized facts on clusters.

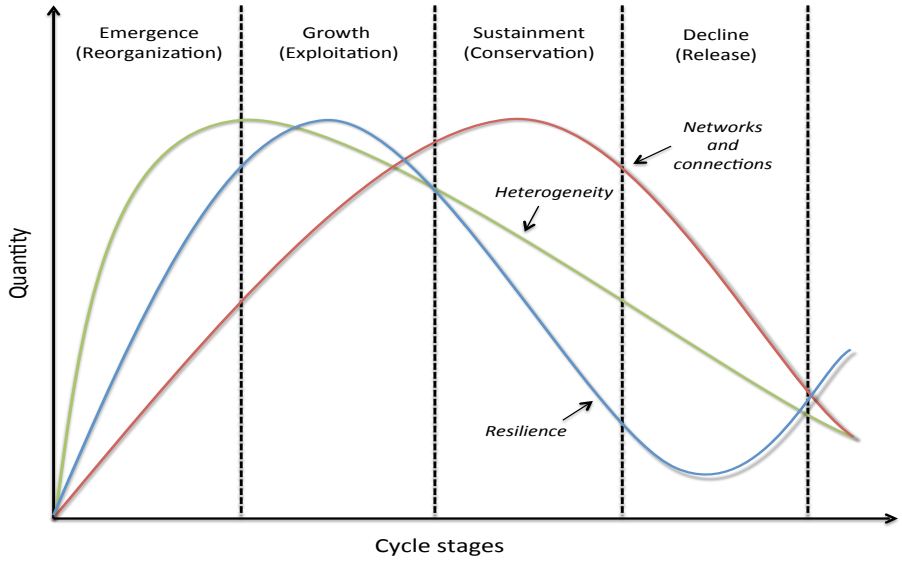


Figure 3: Stylized representation of the trends followed by the different dimensions of change following the conceptual literature on evolutionary cycles

Research horizons

Summarizing, given the increasing recognition that industrial clusters are essentially the outcome of an historical process and can only be fully understood as such, scholars haveprogressively developed a conceptual frameworks of life cycle, withits related notions, for the stylized analysis of their historical development. These conception, however, is partially at odd with the non-equilibrist and unpredictable nature often followed by regional trajectories, for which it was developed instead a framework of adaptive cycle. Considering this current issue, along with the yet limited amount of studies conducted in this niche, it is clear that the literature on such concepts clearly necessitates further research and insights.

Following,in particular, the roadmap for future research on clusters outlined by Boschma and Fornahl (2011), it is understood how the various frameworks of evolutionary cycle could effectively benefit from insights coming from various fields of research for their theoretical refinement, this is especially due to their rather all-comprehensive nature of these concepts. However the authors basically claim that, in order to increase the knowledge about the topic new contributors should focus in particular on two main aspects. Firstly, it is evidenced that, given the variety of different meta-models available, further research should not only focus on discovering the most appropriate among them, rather, it is desirable the creation of

frameworks eventually able to combine the strengths of different theoretical perspectives. In addition, more than reflecting on the stylized characteristics of the stages of an evolutionary cycle, there is a compelling need of investigating what are the dynamics behind such transition from one phase to another. Secondly, it has been argued that further efforts should be undertaken in order to apply theories deriving from cluster-cycle studies to a major number of empirical cases. It is, in effect, only through the direct application of such concepts as tools of analysis for cluster evolution that is possible to make considerations about the explanatory power and validity of the latters. Thus, still following Boschma and Fornhal, the methodology used for such enquires should probably adopt a longitudinal/historical perspective accompanied by an extensive use of different types of data, and should make a prominent use of in-depth single or comparative case studies. In last instance - and relatedly to the above outlined challenges - further conceptualizations are needed considering the varying dimensions of change of clusters' development and the relations between their trends and the process of evolutionary cycle. Precisely, it must be scrutinized to what extent such dimensions effectively follow stylized trajectories related to the sequence of different stages and what is their influence on clusters' fitness and outcomes.

To conclude, in this session we have reviewed how EEG has progressively dealt with models of clusters' evolution, thanks to the contribution of different approaches and methodologies starting from life to adaptive cycle. Permitting that, we do not aim to assess the absolute validity of some of these frameworks in respect to others, but we seek to apply extensively these new born concepts in order to amplify their scope for research, in the next sessions of this paper, we are going analyse in-depth the evolution of the district of Castel Goffredo using the insights given by the previously discussed EEG life cycle models. Thus, we will aim to give a more clear and dynamic perspective about the evolution of the district from its emergence to more recent times.

4. The cluster cycleof Castel Goffredo:the case study the and methodology

In this session, we introduce the subject of our research: the hosiery-textile industrial district of Castel Goffredo. Notwithstanding its prodigious growth in previous decades, and the economic position conquered in its sector of industry- in which Castel Goffredo's still ranks high, despite the fierce ongoing economic crisis-, the district is in effect in a status of clear decline for what concerns the increasing trend toward industrial mono-structures and the problems linked to the maintaining of levels of employment (which are seen steadily decreasing in recent decades). What should be noted is also that this period of decay was hardly perceived, by both district actors and experts, before it arrived almost overnight. Thus after having described the characteristics of the clusters and its actual issues, we explain to what purpose and how we decided to undertake a historical life-cycle perspective of the districts' evolution.

4.1 Research subject: the hosieries' district of Castel Goffredo

The district of Castel Goffredo is a textile industrial agglomeration located in Northern Italy, in the south-east of the region Lombardy, and it sprawls on the rather flat and foggy territory of the upper Po Valley. The district is specialized in the production of hosieries but it produces and exports also other varieties of stockings and textile goods employing the same type of seamless technology (knitwear, sportswear, freewear, homewear, softwear, spawear, nightwear). It is well known that the district emerged in the years immediately after the post-war period and especially developed in the following seventies and eighties, comprising, during its point of apogee, at least 25 different municipalities. Nowadays, the agglomeration counts, in total, more than 250 firms belonging to the same (or similar) industrial theme and of different size, which spread on the territory of three different Lombard provinces, within an area of about 353 km^2 (osservatoriodistretti.org, 2011). The majority of the actual population of firms is located in the province of Mantua (comprising the municipalities of: Asola, Casalmoro, Casaloldo, Casalromano, Castel Goffredo, Castiglione delle Siviere, Ceresara, Mariana Mantovana, Medole, Piubega, Solferino); few dozens in the lower part of province of Brescia (thus in the area of Acquafredda, Remedello and Visano); and only few units are still present in the province of Cremona (in the municipality of Isola Dovarese). As in the majority of Italian IDs, the district of Castel Goffredo shares a strong bond with the territory in which is located, and most firms within the district have the peculiarities of a family-businesses orientation. In fact, economic activities are often directly run by the members or descendants

of the founders' family, and, also in the case of largest and much more internationalized firms, in many cases the figure of the business manager still coincides with the one of the owner him/herself.

The national state and the region of Lombardy have long recognized legally and administratively the district of Castel Goffredo since 1993, and, through various administrative orders of the regional council, it has been named and classified as the "District N^{o} 6 Textile-Hosieries". However, the district is not yet subscribed to the Italian Federation of Industrial Districts (osservatoriodistretti.org, 2011).

District's peculiarities and potential

Since more than fifty years, the district is one of the largest European industrial agglomerations based on textiles, and it traditionally ranks high both in their production and export, not only at the national and continental, but also at the global level. The district traditionally accounts for 75%, 60% and 30% respectively of the national, European and worldwide production of hosieries, for an average total annual turnover of more than 1 billion euros (osservatoriodistretti.org, 2011). Scholars have observed that the reasons of such success, which officially started from the seventies, might be ascribable to many factors. In first instance -as in the case of many other Italian industrial districts- it has been glorified the flexible, fragmented, but at the same time highly specialized and horizontal structure of the cluster, based on a multitude of small firms and laboratories reflecting the decomposability productive cycle (Rosenfeld, 1997;Lazerson and Lorenzoni, 1999). In effect, outsourcing remains nowadays largely undertaken within the district (Capasso et al., 2013) and it constitutes one of the main point of strength of the system (ilsole24ore. it, 2012). The physical production of hosieries is, articulated in six different steps, which differ from each other both for the technologies and competencies needed, and that therefore encourage the development of micro-entrepreneurship. Here we list them, briefly explain their characteristics, and their recent developments [44]:

- *Texturization*: is the initial step of the hosieries' production and it basically consists in the preparation of the thread for its later usage. Through a process based on heating, stretching and cooling the thread is rendered sufficiently elastic and uniform, thereafter, yarns are conserved in chambers with controlled climate and humidity.

[44]The full industrial process of hosieries' would include also steps like the production and provision of the thread -along with other basic materials-, coming prior to concrete production, and would see the commercialization of the finite products as final stage. These are activities present and contributing to the identity of the district, but not strongly linked with the traditional and concrete process of hosieries production.

Since mainly based on the efficiency of machineries and instrumentation and not requiring huge amount of workforce, this first phase of production is also one of the most capital intensive of the entire productive cycle. In recent years the number of firms undertaking only texturization have dramatically diminished since firms of nearby phases –thus, thread producers and, sometimes, weavers- have tended to internalize such function.

- *Weaving:* weaving is traditionally the "core activity" in the production of hosieries and of the district of Castel Goffredo and it is when the thread is assembled and combined by peculiar circular (or twisting) machines, which create the tubular-shaped body of the product. Due to its characteristics, this phase might be considered between labour and capital intensive. On the hand, numerous and sufficiently skilled workforce is required for the right functioning of implants, supervising and storage of products, hence this makes weaving an activity still predominantly labour intensive. On the other hand, the periodical renewal of machineries -which, are constantly upgraded- is crucial for the success of the firms undertaking this step, and recent advancements in automation and computerisation have rendered this phase increasingly more based on capital and investments.
- *Sewing:* after having been produced, the different parts of the product must be put together by means of seam, it is therefore sewing the part of hosieries production cycle much more needing manual labour. Although upgraded circular machines are nowadays able to seam different parts already during the weaving of the products -as for example the elastic-, for may operations the human hand remains irreplaceable, especially for what concerns the quality of the action. Due to its highly labour-dependent nature, this stage risks to progressively disappear in the district, relocated in countries with lower costs of production and labour.
- *Dyeing:* it is the phase in which the almost finite product is given a colour different from the one of the original material of production (usually white, grey, or beige). Not long ago, the colouration of hosieries was obtained through the direct immersion of hosieries in appropriated containers filled with colour and the phase depended much more on manual work. However, in last decades, firms undertaking this step have opted for decisively more automated implants based on the colouration with spray gun techniques in hermetically closed small boxes, which, in addition to overall improve the quality of products (in fact, the fibres are less distressed and the colour results more uniform), are much more ecologically respectful. The phase of dyeing is, therefore, typically capital-intensive, necessitates energy and investments. Not only for what concerns the technology needed for production, but also because particular

instrumentations must return the huge amount of water used for the process within certain parameters of purity.

- *Checking, finishing and ironing:* these three final phases of production are all essentially high labour-intensive and they can be considered as one final unique stage (in fact, they are traditionally undertaken together by firms and not separately). Finished products are checked through manual application to limb-shaped metal tools and eventually ironed in order to appear less creased in the eyes of future customers. However, also firms undertaking these steps have seen in recent years a sharp decrease in their number: firstly, because improved technologies and materials have granted products for which this passages has become obsolete for outsourcers; secondly, because this phase was frequently internalized by dyers.
- *Confection:* the last phase of production is not directly linked with the product in itself but with its packaging. The confectioning is not only important for the protection and conservation of the finite good, but also because the involucro serves as intermediary with costumers, who come to know about the product qualities and characteristics by reading on it. Traditionally, confection was a manual and labour-intensive operation, in which hosieries were put in small cartoon boxes by and, then, returned to outsourcers. However, automation as frequently permitted also the internalization of this passage, especially in large and vertically integrated firms. Furthermore, cartoon boxes were progressively substituted by plastic bags, which, in addition to grant a better conservation and a more attractive appearance, are more practical in terms of space and transports.

Thus, according to scholars it was such decomposability and complementariety of the process of production the factor which allowed the birth of a district based on medium small enterprises, boosting both vertical cooperation and horizontal competition between firms. Still nowadays, although the district appears much more verticalized and dependent on the performance of a restricted group of about 10 leading firms -which invoice the majority of turnover -, 80% of existent stocking industries are still relatively small activities based on subcontracting to the leading firms or also to external actors through their private brands. Such assets have been alleged to have kept prices relatively low in relation to the high quality of productions, and it has been observed how, firms in Castel Goffredo have always been sensible toward the importance of innovation, which was always undertaken periodically by the majority of firms, almost regardless their size (see Capasso and Morrison, 2013). In this sense, the district focussed particularly on the empowerment and optimisation of the productive cycle and, in recent decades, has seen an inclination of the entire system toward specialization and more capital-intensive methodologies of production, absolutely cutting-

edge in the stocking sector and textiles. Besides, in the decades, entrepreneurs also had time to refine their commercial and managerial abilities: firstly by shorting the number of intermediaries needed, and directly locating and selling their products; secondly, by increasing their attention on the value-added factors like fashion, marketing, brand promotion and ecologic compatibility (important was, in this case, also the presence of the local 'Centro Servizi Calza', which furnished courses aimed to increase such abilities). In last instance, it must be noted how the true potential of the district basically rests in its openness toward foreign exports and internationalisation, factors which permitted the flourishing of firms (especially the larger ones) also in face of globalisation processes and lowering of internal demand. The district was in effect able to keep its leading role by maintaining high and dominant its exports on the foreign markets of: Russia, Eastern Europe, Great Britain, Northern Europe, Israel, Australia and USA, exporting 2/3 of its total production. In order to achieve such results, a consistent part of labour intensive phases were unavoidably relocated abroad, however, the also relocation process was for a long time contained, since the specificity of the competences available within the district's geographical boundaries were hardly available or replaceable elsewhere (osservatoriodistretti.it, 2011). In this sense, the district as a system performed relatively well -also in a period of crisis and globalisation- in terms of exports, losing relatively few of the total global share (from 30 to 27%, due to the entering of global competitors) and increasing the hegemony on the national and European market (respectively shifting to 80% and 71,6%) (ilsole 24ore. it, 2012).

"Recent" problems

However, notwithstanding the still high results obtained, the hosiery district could not avoid the falling into a sort of rather unexpected 'infinite crisis', which, starting visibly after 2000, has been wearing out the district for at least fifteen years. More than a decrease in the total turnover (that, although fluctuating depending from the year, has remained more or less steady), the problems of the district concern the progressive disappearance of large parts of the population of firms, with related increasing levels of local unemployment, since both neighbouring competitors and regional economy have proved hardly able to fully absorb redundancies. Precisely, from a 8500 total number of employed in 2001, the district passed to a 6700 in 2005 (Gazzettadimantova.it, 2012). Considering the nineties as a starting point, the total number of organisations operating, on the territory, in the stocking sector, is recently almost halved, and levels of employment recently decreased again. In 2012, almost 1500 of the remaining 5000 employees had to rely on networks of social welfare (osservatoriodistretti.it, 2011; gazzettadimantova.it, 2012). Although the change did not spare

completely even larger firms with much more visibility and capital (and could relocate de facto some of their segments), the category most hardly hit was the one of small subcontractors, of which the survivalists were, for the majority, only those who could maintain a certain level of uniqueness in their production or a direct connection with outsourcers also external to the district.

Entrepreneurs and experts operating within (or for) the industrial district have given different interpretation and blamed various factors for what concerns the causes of this long-standing decline (see osservatoriodistretti, 2011 and ilsole24ore, 2012). Firstly, one of the most evident trends is the general decrease in the consumption of hosieries and pantyhose (especially at the European level), due to factors strictly linked with the nature of product itself. What is clear and straightforward is that the product itself had long reached a certain maturity. Hosieries of the 21th century hardly rip or snag, new materials and technologies of productions have highly improved the quality and resistance of finite products, and have, therefore, decreased their likelihood of being replaced. In second instance, it has been argued that the decrease in consumption has to do also with other more volatile -but obvious- factors, like the changes in fashion and customs (which have witnessed the progressive utilization of garments, like trousers, also in the female clothing) and even unfavourable meteorological periods (it is a fact that the sensibly warmer average temperatures of recent years also led to an overall lower consumption of hosieries). Secondly, what is often complained by district actors is the inefficiency of the national administrative and economic system. Italy ranks, in effect, particularly high in the costs of energies and resources needed for its industries , and, in the case of Castel Goffredo, particularly costly are the polymers needed for the creation of threads and the energy for the functioning of implants. Furthermore, the transformed, post-industrial and matured national economic landscape implies a higher costs of labour, taxes and also a particularly articulated and heavy regime of bureaucracy (considered particularly detrimental by entrepreneurs). Some recent interpretations, largely seasoned by the particularly turmoiled socio-political situation, have tended to identify in the adoption of the unique currency (Euro) the true cause of districts decline, included Castel Goffredo (many entrepreneurs complain about the fact that the monetary policy, does not permit strategic de-evaluation for sellings). Thirdly, it is clear that globalisation brought many new occasions for business, but also many other competing environments with which the district had to cope with. In particular, countries of the Near and Far East (especially China and Turkey), although still not able to compete against Castel Goffredo in terms of quality and proficiency, managed to occupy more quantitative and cheaper portions of the stocking market (which in a situation of general economic crisis tend to sell more). Thus, although heavily underestimated at the beginning, the question about foreign competitors (which are also progressively

acquiring more competences) is becoming a real threat for the actual assets. In recent years, it has also been observed how the total relocation of some industrial phases and implants was avoided only thanks to the birth, in Castel Goffredo, of many hidden labouratories held by Chinese immigrats, 'on the edge of law and legality' (gazzettadimantova, 2012).

An opportunity for research

In sum, after 2000, the hosiery district has maintained a relevant international position, but could not escape from a long phase of "slow-burn decline", which affected especially the levels of employment and provoked considerable bother for the local economy. As understood, this phase of decline started suddenly as much as unexpectedly, and none of previous reports or research could predict the difficult period that the district was going to face. The majority of recent opinions, tend to agree about the fact that the difficult situation- in which the district still rests- was caused by a series of external shocks, set in turn by an idiosyncrasy of various different exogenous elements trascending the nature of the ditrict itself. It is therefore evident how the debate on Castel Goffredo focussed prominently on mainstream and -at best- institutional economic analyses. Without denying the importance of factors like: global-economic shifts, external shocks, and issues linked to more macro-economic or institutional situation, in this dissertation we wanted to scrutinize deeper and from a more endogenous/historical point of view the motivations which brought to district decline. More precisely, we were skeptical about drawing conclusions only derived by the analysis of current assets, which –as proven in the case of Castel Goffredo- are often insuficient to explain the complexity of clusters' evolution. Thus, in line with the EEG perspectives, we attempted to perform an historical life-cycle analysis on the district, by following the assumption that: much of the the questions concerning present and future, might be answered by directly studying the past of the case in question.

4.2. An historical life-cycle approach for Castel Goffredo: methodology.

The research on Castel Goffredo's cluster life-cycle was realised with the help of different methodologies of research, since the notion itself is comprehensive of many different concepts which better require an heterogeneous approach for their study.

1. ***Analysis of reports and previous researches***

In order to start the life-cycle analysis the first step undertaken was a review of previous reports and researches having as central subject the district of Castel Goffredo prior to what is commonly considered its phase of decline (thus before 2000). In so doing, it was selected and analysed a series of dissertations all written in the decade of the nineties (in Italian language), and having different characteristics, focal points and aims of research. The purpose of such analysis was, in addition to give to researcher a wider and more concrete knowledge about the case studied, to configure in more general terms what was the historical development of the district. In this sense, each report had a different value for the research depending from the period of cluster evolution investigated. The main sources for research which have been used are listed below, with respective translated titles, authors, characteristics and utility for the present research[45]:

- "*Origins and consolidation of the Mantua-Brescia hosieries cluster"* (Giancarlo Leoni, 1992): the one written by Leoni is only one chapter of a wider report discussing more in general the structure of Italian IDs. This work was particularly valuable for the scope of our research, since –although not dealing, obviously, with concepts of life-cycle - it has been the only one attempting to describe the development of the district from a more sequenced and temporal perspective. In fact, before describing the (at that time) contingent situation, the author spends considerable words in describing the different historical periods characterizing the district evolution. In this sense, we expected to find from this source information valuable for all the stages of cluster development.
- "*Weaves of silk, the genesis of Castel Goffredo's district*" (Cristiana Arrighi, 1998): this book was written as an academic master thesis and its principal aim was to shed light on the socio-economic situation occurring in the territory prior to the birth of the district. In addition, the author attempted to research the processes and events leading, in effect, to the first development of the district. Thus, it almost goes without saying that the work of Arrighi presented an indispensable source to investigate on emerging and early stages of district's evolution.
- "*Competitive dynamics in the female stocking industrial sector*" (Federico Testa, 1993): also this text is of an academic nature. Rather than a research solely focussed on the district of Castel Goffredo, the work of Testa was a discussion about the development and status of the entire national stocking sector, before and during the nineties. However, (due to the importance of the area of Castel Goffredo in the sector

[45] In the literature such sources are listed with their original names and formal references.

of hosieries) much of his research was carried out, in deep, directly in the district. This source, in addition to furnish a considerable richness of data and more technical and complete explanations concerning the stocking sector, is valuable for the analysis of both early (particularly important are interviews made to first entrepreneurs) and advanced stages of cluster development.

- *"One hundred years history of the Rural and Artisan bank of Castel Goffredo"* (Carlo Marco Belfanti, 1995): this source is a short foray written by the professor Belfanti committed by the local bank of Castel Goffredo. It discusses the history and events related to the local bank, well known for its role of intermediate organisation between local economic actors and social parties, of which the history is strictly connected with the one of the hosiery district. Form this source we expected to find valuable information about the evolving of relations between the district and its regional economic environment.
- *"On the thread of equilibrium, the district of Castel Goffredo approaching 2000"* (Costantino Cipolla, Paolo Polettini, Davide Galesi, 1999): this report was the result of a collaboration between the local R&D: the Centro Servizi Calze, the province of Mantua and various academic contributions. It is a dissertation much cited also in other academic studies, and it is part of a quinquennial series of reports written on the status of the district, starting the foundation of the R&D .The aim of this dissertation was to make a point of the present considering the previous reports , and give additional theoretical insights on the peculiar industrial frame characterizing the district. In addition the report discussed the perspectives for district's development in face of globalisation. This source was considered especially for what concerns the period of the nineties, immediately before the district' well known decline.

The review and analysis of the information contained in such texts should permit to make first assumptions for what concerns the identification of different historical periods of cluster development and the aim was basically to realize a complete description of the district's history by starting from what had already been discovered and reported by previous sources. Furthermore, in this phase of research were already expected to detect the different *evolutionary factors* (Bellussi and Sedita, 2009) responsible of different periods of cluster development, conditioning the structure of its path-dependence. However, this was only an initial step and further insights from field research were needed, in addition to an only compilatory and descriptive research, in order to have a more precise, all-comprising and clearer idea about the different phases of district's evolution.

2. *Study on the historical population of firms*

A further contribution to the identification of Castel Goffredo's different cluster's life-stages, is given by the study of the district's historical population of firms, with an eye to trends and peculiarities of the latter from emergence to 2000. However, no previous sources were already available reporting, precisely and comprehensively, series of data concerning the population of firms in the district (apart from some sporadic and periodical researches, which could not permit a full reconstruction of the firms' demographic process). Thus, for this purpose, an "ad hoc" digital database was built, with the materials furnished by the Mantua's local chamber of commerce, through the progressive scrutiny of provincial business registers and archival documents. It was this one, in effect, the longest and most time-consuming part of the fieldwork, since it consisted in the painstaking task of examining a huge quantity of papery materials (in which are enlisted all kind of business activities at the provincial level) in search of firms related to the sector of stocking industry. to be reported manually in the database. Organisations were enlisted and classified with a particular attention for some of their features in order to permit further analysis :

1. Firms were registered with their names, the name of owner entrepreneur(s) and were differently classified during the transcription depending from the type of activity undertaken. The purpose of this passage was to attempt the making of a differentiation between the firms registered as proper stocking industries and those working as subcontractors. In this sense, were classified with an A category the firms enlisted as "Calzifici"(stocking industries, hosieries manufactures), often undertaking more than one or the most central steps in the production of goods (such as production) and supposedly located higher in the productive hierarchy; while were assigned a B the firms mostly appearing as pure subcontractors, committed only to the realization of specific passages, registered with the name of the activity (texturing, confection, dyeing) and often –even though not in every case- of reduced dimensions in respect of "proper" stocking industries. This, since we were interested in assessing the eventual differences in the firms' population trend depending from the type of business considered.

2. Mostly important, date of birth and eventual closure of firms were registered in order to permit estimations and realization of graphs of the population of firms between stocking industries and their subcontractors. In this sense, the aim of this research step was to give a more historical, dynamic -but at the same time immediate-

perspective of the district evolution, by using the trends of firms' population as additional spectrum for the division in life-cycle stages. Following this, obtaining the total and annual numbers of entry and exists also permitted an analysis of the levels of turbulence in the district's system (thus the proportion between entry and exists within a certain period), as good indicators of entrepreneurial activity alleged to vary depending from the period of development. The construction of an indicator in order to evaluate the turbulence rate was estimated following the insights of previous EEG works (such as Trippl and Otto, 2008 and Heebels and Boschma, 2010).

$$Turbolence\ rate_{(t)} = \frac{Entries_t + Exits_t}{Total\ amount\ of\ firms\ in\ 2000}$$

Turbulence rate is here an index aimed to give an immediate idea concerning the total intensity and the degree of entrepreneurial activities, considering a determinate period of cluster's development. This was elaborated by taking into account the whole volume (thus, the sum) of entries and exits within a determinate period in relation with the total amount of firms recalled in the year 2000 (last year of data collection).

$$Turbolence\ rate\ (effectiveness)_{(t)} = \frac{Entries_t - Exits_t}{Total\ amount\ of\ firms\ in\ 2000}$$

Similarly, turbulence rate effectiveness is also a measure of entrepreneurial activity, but, rather than the whole volume of movements, this indicator puts in evidence the balance between entries and exits of the period taken into account.

3. Lastly, the location of start-ups was recalled considering the municipalities in which they occurred. This, in order to have an idea concerning the process of districts expansion and its spatial pattern, supposed to be influenced, not only by factors as economic growth or decline, but also by processes as the maturation and popularity of a given innovation, or the more codified and available knowledge linked to the expanding industrial sector. Hence in addition to the original and central area of Castel Goffredo, marked as Zone 1 ,in which three other areas were identified: Zone 2, of the municipalities contiguous to the area of Castel Goffredo: Zone 3 municipal areas not properly close or contiguous, but in a range of 15 km from the district "core"; and Zone 4, comprising all the other localities relatively far from the agglomeration of the cluster, in which is recalled the birth of start-ups in the theme of the stocking sector.

Considering that the research was conducted on the geographically-spread reality of the district, but we had the opportunity to consult data only from the local chamber of commerce,

it must be pointed out that this methodology was not without limitations, since it was not possible, for example, to consider the small populations of firms in the province of Brescia and Cremona -registered in other administrative institutes -. Furthermore, as in many other EEG studies, no further in-depth analysis were attempted to understand the real motivations of firms' closure that might imply different perspectives. In this sense, the main point of this research passage was basically to give a more precise quantitative dimension to the differentiation in historical periods, and, therefore, relate the trends of the present case study with previous insights and stylized facts evidenced by life or adaptive cycle theories (). It was, in effect, from the study on the historical population of firms, combined with previous findings, that it was possible to outline more precisely the string and length of various life – stages, in tune with the notions and insights of EEG and life and adaptive life-cycle. Furthermore After the division of cluster's development in historical periods and life-stages, further research was needed in order to shed additional light on the characteristics of the latters and, in particular, to investigate on the different historical dimensions of cluster evolution.

3. Grounded theory and qualitative analysis

To conclude and complete the identification of the historical sequences of cluster evolution the research availed itself also of data obtained from interviews and focus groups with different actors (entrepreneurs and experts) who witnessed different periods of districts development, and whose memories and information were crucial to understand many aspects of district's evolution. Precisely, we pursued grounded theory especially to investigate on those aspect of "connectedness" of the system, which, especially from an historical perspective, were hardly researchable in a different manner. For this purpose, five interviews and two focus groups were undertaken, for a total of twelve participants involved. Participants were sampled and interviewed after the analysis of historical reports and population of firms, so that the already emerged phases of evolution could be better integrated with the results obtained. Due to facts prominently linked with the ethics and morality of the research, but also in order to gain more exhaustive and fearless information from participants, we decided to conduct this qualitative research anonymously and proper nouns of persons and organisations were mostly obscured.

Interview 1: this first interview was conducted with the collaboration of an expert, who both studied and worked for the context of the district. It was mainly aimed to the investigation of initial stages of cluster development, but also to acquire more general data on the district as a system.

Focus group 1: it was conducted with a rather free register and involved the presence of four different actors: two ex-employees of NOEMI, later working for other stocking firms and then retired; a local entrepreneur who started his activity in very early years of district's development and is still operative on the territory (specialized in the weaving phase); and a local politician. The focus group was mainly oriented to seek answers about the first period of district's development but some data revealed valuable also for later stages (especially for what concerns some of the entrepreneur's declarations).

Interviews 2,3 and 4: all this semi-structured interviews were carried out singularly with entrepreneurs having their activity within the boundaries of the industrial district since at least two decades. The main purpose of such enquiries was to consider their personal impressions, implications and sentiments about being located in a cluster. Given the more recent experience of the interviewed, questions were structured especially to source data about and already well-developed reality of the industrial district (after the 70's/80's).

Focus group 2: slightly more structured in respect of the previous one, it was undertaken through a direct discussion with three experts currently working for the reality of the district, but who also have a background of entrepreneurs. This focus group was aimed to discuss the most recent part of the historical period taken into account, and, in particular, to the deepen the perspective in regard of recursive structural problems linked to a post-development phase, .

Interview 5: the last interview was conducted with the exponent of a public-institutional organ operating in the district. In this case, the main themes of the interview were: the relation between institutional environment and the firms in the industrial district;

For what concerns this last step of field research, it was expected that information and results furnished by grounded theories could contribute to furnish additional information, based on appreciative theorizing , about particular aspects of life-stages and their dynamics. In particular, in depth analysis was employed for in this dissertation- but still in association with previous results- for the interpreting of the variations of connectedness (heterogeneity and networks) and resilience. In addition,

5. Research findings: historical periods, life stages and analysis

In this session of the report we outline the main findings of our research. On the basis of the work done, four different periods of cluster's development were identified, referable to different stages of life-cycle development. In such regard, the process is explained in chronological order, in the sense that, after having detected approximately the period of cluster's birth, we followed various passages of its development, until stopping to 2000. Since, each one of the following four sub-sessions describes a different historical period of Castel Goffredo's development, a particular structure was chosen in order to better explain results, the process of research and the reasoning behind the consequent identification of life-stages. For this purpose sub-sessions have been, in their turn, divided in parts about "*field research*" followed by others of "*analysis*". The parts concerning field research are essentially aimed to report and explain the results of research obtained through the methods of reports' analysis, study of firms' population and grounded theory. The parts of analysis are instead those in which the results are discussed, interpreted and bridged with the theoretical framework and assumption of this dissertation. In other words, results for each historical period studied are reported, discussed and further associated to a phase of a different phase of evolutionary cycle.Finally, the fifth and last sub-session consists in a more critical summary/discussion of the main findings about Castel Goffredo's historical life-stages and related concepts.

5.1 First period: The birth of NO. E. MI and district's emergence (1920- 1956)

5.1.1 Field research

Reports'analysis

The history of Castel Goffredo's hosieries district, begins loosely connectedwith a political homicide, happened in 1921 in the town, an event thathad as protagonist the future entrepreneur Delfino Eoli, described by sourcesas an early and fierce fascist). Involved in the case, he was forced to expatriate in Chemnitz, Germany, where he worked as a technician in various textile industries and was therefore probably able to acquire considerable experience in the field (Arrighi, p.141). The future entrepreneur was then allowed to return in his motherland only after few years, when Fascism (the political party to which Defino Eoli was enrolled from its very early rise) was able to definitely gain the upper hand on the territory and on the whole country, thus, permitting his re-entry also in what was a favourable political environment for him (Arrighi, p.141). Strong of his experience abroad, the entrepreneur

decided to start a new activity in joined venture with his brother Oreste, skilled in accountability and management, and the engineer Achille Nodari who had enough capital to start the business, and had, prominently, a financing role in the project. The group founded a firm with legal head office in Milan, which was named, for this reason, NO.E.MI (Nodari Eoli Milan)(Arrighi, p.141; Testa, p.54-55). Differently from the previous activities that attempted their start on the territory - but failed also due to the high fiscal pressure-, Noemi was particularly favoured in such instance. Delfino Eoli presented to the municipality a proposal in which he demanded the complete exemption of the firm from taxes for all the 7 upcoming years, stressing the importance that the new industry would have had for the local community. The local organs accepted the request, given its validity, but also due to the highly influential figure of Delfino (Arrighi, p.142).The entrepreneurs started their activity by initially importing from Germany all the machineries and expertise needed for the functioning of the industry. The German enterprises, builders of the looms, followed a precise sequence for the installation and departure of industrial implants: first of all, engineers were sent for the assemblage, followed by skilled workers and technicians who had to set the machines operatives. Thus,a sizeable number of German workers were initially hired with advantageous contracts, and were backed by local young workers who had to become skilled and expert in the difficult utilization of the Cotton Looms (Arrighi, p.143). As understood, in fact, working on such machineries was everything but an easy task, which necessitated a particular amount of practice and expertise to be performed correctly:

> It was extremely difficult, even if you had a great devotion and talent, the minimum amount of time required to work with such machines was two years: it was worth 45 millions, which in 1948 was a huge expense. The loom was 32 meters long and required particular mechanical manoeuvres. If you failed single a manoeuvre this could provoke a damage that required 3 to 4 week to be fixed. (Testa, p. 57)

This Italo-German synergy became a vaunt in those years of fascist regime, and it was emphasized by the very same propaganda, which the firm was promoting in order to diffuse its brand on national and foreign markets. On formal documents it was reported the phrase "German Organization for the production of the finest hosiery" and one of these, dated 3rd July 1930, reports "Strumpfefabrick- Chemnitz- Ing. Nodari & Eoli", as further proof of such solid linkage (Arrighi, 143). After its establishment, the firm quickly became highly operative and in few years it reached its apex, by giving job to more than 500 employees, surviving with relative ease also the years of the war. Furthermore, in addition to increase the wealth of the territory, the firm introduced de facto the industry in the area, becoming an "incubator" for new competences other than the mere agriculture and craftsmanship (Leoni, p.87).

> As soon as I finished secondary school, I was hired by Noemi, and this was a great achievement since, at those times, Noemi had become a sort of gym for all those who continued the activity, no matter if future entrepreneurs, technicians or employees (…) Noemi had already proven and qualified methodologies of production. I worked there two years and I must admit that I learnt many things. (Testa, p. 57)

However, an inescapable decline of the firm had already begun in the years before the end of the war. In fact, in addition to the generally unfavourable economic conditions, the situation was threatened by growing disagreements and frictions between the two brothers-owners. This situation resulted in the departure of the historical founder, Delfino Eoli, from the firm (Arrighi, p. 148). It was understood thatOreste Eoli, remained alone, was not able to display the same technological abilities and industrial attitude, peculiar of his brother – in particular for what concerned the renewal of obsolete machineries and the attitude toward new innovations (Arrighi, 150). Precisely, Oreste neglected the potential represented by the recently invented "circular machines" (Leoni, p. 88), which were, at that time, silently gaining ground in the sector of stocking industry. In addition, also for what concerned his relationship with the employees, Oreste was lacking contact, and, his progressive delays and cuts of salaries were further hindering its managerial image. This situation initially caused a massive migration of the most skilled technicians and loom-workers toward the recently open "sibling" stocking industry in Faenza (OMSA) (Arrighi, p.150). Few pioneers, instead, decided to take the risk and start and activity on their own by purchasing the circular machines extremely recently developed by the enterprises of Brescia. Initially, this was not clearly an easy choice for the exiting employees/future entrepreneurs, as well as for the local credit and financial actors, who had to bet by investing savings in something that was still highly unsure compared to previous activities.

> We needed two millions and a half. But we did not have them. Then I said, let's go to the rural bank. The banking executive director told him (my father): don't do it! You are going to destroy your few savings! He was afraid (…) we came back also with my mother, who had more courage (…) then, the director said he was going to grant us credit, but only with the guarantee of a complete mortgage (…) thus, under the pressure of my mother my daddy signed the contract (…) she was also terribly afraid, but had a different spirit (…) when we established the firm my father remained with only one cow left (…) both enthusiasm and tensions were extremely high… (Testa, p. 61)

In few years, however, their success and profits became visible to the whole town's community.

Studies on the population of firms

Considering the period going from 1920 to 1956 it is alleged that NOEMI remained as a rather unique industrial reality in the area in the decades before development, in fact no other

stocking industries are recalled on local registers labelled as "stocking industries" in the area. Hosieries - as many other textiles prior to the arrival of industries - were rather handcrafted by the multitude of artisanal laboratories present in large quantities on the territory. Thus, at the dawn of its development, the cluster of Castel Goffredo was hardly perceivable. According to the data collected and analysed, in the period between 1952 and 1956 it is recalled the birth of only 3 new firms specifically oriented to the production of hosieries, scattered on the provincial territory.The first firm was founded in the municipality of Mantua, thus, relatively far from the future district's area (Zone 4); and two others later established in the localities of Medole and Castel Goffredo (Respectively, Zone 2 and Zone 1). While it is unknown how was exactly the owner of the first firm founded (apparently the activity did not have long life and stood for less than three years), it is understood, through reports and interviews, that stocking industries in the area of Castel Goffredo were established by NOEMI's ex-employees and had a considerable fortunes in following years – this in line with previous researches conducted on the district.

Codes from interviews and focus groups

There were historical factors and, hence, fortuity…historical events which permitted the birth of the first industry here in Castel Goffredo…who knows if they still would have established the firm, without such historical events? (Interview 1)

Firstly, socks were made of silk… of which the thread was already produced and well known by Castel Goffredo's population…the breeding of silkworm was diffused in the area…silk could also be supplied in loco…this was probably an advantage…(Interview 1)

The major, at those times it was called the "podestà"…(Eoli and him) they were on the same wavelength…and were, for sure, politically advantaged (Interview 1*)*

…in addition to transfer new knowledge to the future entrepreneurs, many Germans remained to live here…I have seen many exchanges in the local municipality…a bond was created, facilitated by those times…(Interview 1)

Noemi did not produce only socks, but also knits, especially shirts, the famous "Saharians shirts" in silk…only in the end they brought everything on socks…(Focus group 1)

5.1.2 Analysis

The NO.E.MI: components of a triggering factor

It appears clear enough that the "official" triggering factor responsible for the centred formation of the district is, at least in the case of Castel Goffredo, the establishment on the territory of a foreign anchor firm, that brought novelty, opportunities and functioned as an anchor firm for future new activities. However instead of considering the incoming of the firm as a rather adventitious and detached eventit could be observed, in this instance, how the insurgence of such triggering factor in itself, is conditioned by heterogeneous processes. Thorough an accurate observation, it would be possible to state that, particularly in the case of Castel Goffredo, the first pattern of emergence is almost completely ascribable to the idiosyncratic triad of accidental events, path-dependency and strategic action discussed by with the clear instauration of a trans-regional knowledge pipeline.To begin with, an abundant contribution of chance and historical at the base of the district's emergence might be found in the process, which put Delfino Eoli eventually in contact with the promising innovation of the hosiery industry. In this sense, it might appear cynical, but at the same time realistic, to state that the chain of unfortunate events, which brought the future entrepreneur to expatriate, were, after all, the very same causes which brought to the fortunate rise of the textile cluster in a future. The exile of Eoli in Chemnitz (unwillingly) created a dialogue between two different technological realities and conceived practically the prerequisite for the emergence of a new industry in the region of Castel Goffredo. By "being there" and work, the entrepreneur could understand deeply the functioning of machineries and the organization of labour necessary for the set-up of such industry. Hence, it is hinted that it probably it appeared straightforward the potential of such industrial assets to Eoli, who further decided to implement it in the reality of Castel Goffredo. In other words, Eoli became the beneficiary of an important external "economic knowledge buzz" that would not have happened if, by chance, he was not forced to migrate.In second instance, it must be considered the component of path-dependency. In fact, even before the advent of the new industry, the area of Castel Goffredo was not extraneous to the textile sector as a valuable source of economic income. The activity of tailoring -at that time already spread on the territory particularly in the form of woman labour- and the high availability on the territory of resources, like cotton and silk (initially used in the hosieries production process), were important factors that helped considerably the establishment of a more modern stocking industry. Furthermore, path dependent is also the situation, which sees the agricultural sector in deep crisis and in need for a discontinuous alternative perspective, in terms of employment, for the young labour-force. It might be argued that without such peculiar previous conditions the establishment of NOEMI would have resulted much more problematic or also unrealistic, both in terms of planning and practice.Thirdly, it is evident how the realization and settlement of the new industry was essentially possible thanks to a particular strategic action and political support, which both had a key role in the early history of the district. The creation of NO.E.MI, in fact,

should not be understood only as a predetermined and fortunate chain of event, inasmuch, some individual actors involved, significantly shaped the event with their decisions and their power. It is hinted that the close affiliation of Delfino Eoli and his partners to the political party of Fascism (at those times in absolute power in the country) was of particular help for the rise of their new enterprise, which could benefit, in more than one occasion, from preferential treatments in the form of tax breaks, crucial for the start-up (which was instead denied to other firms that failed). Besides, local institutions were eager to help and converged with the entrepreneurs' project in order to improve the economic conditions of their territory. Thus, has in the case of other clusters, it is possible to state that also in the case of Castel Goffredo the answer to the question "why it began there?" largely rests in the strategic action of some key agents in respect to their goals. In this case, Castel Goffredo might also be considered a good example of those economic regions which, although lacking particular previous endowments and capabilities, have been able to attract them in order to take advantage of a new windows of opportunity. Finally, the establishment and correct functioning of NO.E.MI is secured through the establishment of an authentic trans-local pipeline, which saw for a certain amount of time the collaboration between the two Italian and German territories, for the transmission of know-how. This happening, de facto, with the implantation of the powerful MNC (Srumpfefabrick- Chemnitz- Ing. Nodari & Eoli), which will eventually became, further, the "incubator and mother" of the industrial district. As in the majority of the cases, the creation of a fruitful pipeline was favoured by the fact that the two economic realities, besides being proximate in terms of production system and interests, were linked together by a sense of institutional belonging and propaganda, which clearly facilitated the dialogue between them.

Disagreements and first spinoffs

Once established the first parent firm, the process that saw the emergence of the district stemmed from the failure of the first anchor/mother firm. The beginning of NOEMI's decline strictly coincides with the lost of its head-expert Delfino Eoli, who quit the company due to the disagreements with his partners. The departure of the superior-employee from the enterprise suddenly brought the latter into a period of crisis, from which some employees decided to escape by founding their own activity. It would be realistic to think that, without such disagreements, the permanence of NOEMI on the territory (eventually evolving into a larger mono-structure) would have changed significantly the life path of the district, probably also by undermining the premises for its existence in a future.

Features of an emergence stage

The period of Castel Goffredo's emergence goes from 20' to the first half of the 50'. Considering such timespan, while the first three decades are better definable as sort of "incubation period", the last decade - going from the crisis of NOEMI's crisis to the birth of first firms scattered on the territory - is instead interpretable as the second and "proper" period of district's emergence, where it is observable the cluster in its embryonic form. What is understood is that due to the fact that textiles activities were mostly carried in handcraft laboratories -prior to the arrive of the industry- the production was quite heterogeneous on the territory. It is reported, in fact, that NOEMI itself was not properly a stocking firm but a rather broad textile industry, specialized in many kinds of productions. Along with this it is understood that when first circular machines made their appearance the uncertainty surrounding the new innovation and its success was high.

Although it is clear that in such form the cluster had not reached, yet, neither high levels of capital accumulation or resilience, it might be argued that due to the essentially local nature of such events, the system already possessed, in this instance, a at least a modest degree of interaction between actors. Precisely, the fact that the majority of future entrepreneurs (and workers)shared a common working background (in the NOEMI) and were part of the same local community could have enhanced similarity and connectivity in the "smallness" of the newborn cluster. This is proven by the fact that the success of first entrepreneurs was immediately interpreted as imitable by their "counterparts", within the local community, who could start in turn their activity.

5.2 Second period: Imitation processes and cluster's growth (1957-1974)

5.2.1 Field research

Reports' analysis

In NOEMI's crisis, the re-starting of the industry in Castel Goffredo, crucial was the presence on the territory of the metallurgic and mechanical industrial pole of Brescia, which was located in the vicinity of the future district and already well consolidated at those times. Although not thoroughly documented, it is alleged that technicians and experts from Brescia,in addition to possess a traditional and renowned general knowledge of mechanical engineering, were probably already familiar with the machineries used in the stocking industry, due to their previous relations with NOEMI (in which some twisting machines were already present) (). Anyhow, what is certain is that Brescian engineers were successful in reproducing recently invented circular machines produced by foreign trades (Scott William,

Kovo, Bentley) and propose them in the environment of Castel Goffredo with prices highly affordable (Arrighi, 158). Witnessed the success of the first pioneers who adopted such machineries, a new channel for exchange was opened between the two industrial realities, which were both going to benefit from each other's success.

> Brescian firms producers of machineries for the stocking industry were offering us favourable conditions for payment. In return, our technicians taught them how to perfection their products avoiding them to hire experts from Milan, Faenza, Bologna, Florence, etc. (Testa, p.65)

This informal but solid partnership between the two industrial clusters, which belonged to different sectors, stood also in the following decades and went beyond the mere economic profit.In fact, while Castel Goffredo was becoming leading region in the production of hosieries, many firms from Brescia's mechanical cluster (brands like Santoni and Lonati) reached high level of proficiency in the production of machineries and items for the textile industry. Following this, the adoption of circular machines by Castel Goffredo's entrepreneurs was determinant for the rise and success of the district. Firstly because, similarly to NOEMI, other regions Europe-wide, since vaunting the presence of already established and developed textile industries – which were more oriented to haute couture (like regions of Germany and France) -, appeared to be quite sceptical in regard of what appeared as a such simple innovation. External entrepreneurs and wholesalers, preferred to start by buying from Castel Goffredo's suppliers the products of what they thought it was a temporary fashion, rather than investing in the machineries producing them. In this regard, the district acquired a blatant first-mover advantage (Leoni, p. 88; Testa, p. 59). Secondly, due to their characteristics, circular machines permitted a different approach to entrepreneurship, more based on small enterprises and flexibility. In effect, such endowments, necessitated for their fruitful installation and use, neither the amount of investments, expertise and even space required by the traditional textile industries, based instead on looms (Leoni p. 89).

Fortunately, the adoption of circular machines arrived in combination with the economic situation of the 60', which was notoriously a growing one especially for what concerned textiles sectors. The introduction of nylon fibre completely revolutionized the commercial idea of hosieries, which turned from being an almost luxury good to a product of mass consumption, produced in large quantities. In addition, significant changes in the canons of fashion and costume in Europe, brought, in this period, to the affirmation of garments like short dresses and mini-skirts, which required to be worn with hosieries (Arrighi, p.). This, resulted in a sharp increase in the demand of products, which clearly benefitted first firms.

> It was the moment of "boom", practically people were eager to steal the socks from you! In that moment, money was entering from everywhere: from the windows and the door…Compared to nowadays (the 90') production was low, but in two years you could afford anything: it was the moment of development (Testa, p.58)

> While first entrepreneurs were mostly technicians and employees directly from the decaying NOEMI, the number skilled workers able to start a firm rose also thanks to the newly promulged national laws regulating apprenticeship contracts (Leoni, p. 87-88).

Consequently, the district developed in the area of Castel Goffredo, but following a consistent decentralisation, essentially due to the "familiar and rural" nature of the business (Leoni, p. 89; Testa, p.61). In first instance, the purchasing power apt to buy machineries came often directly from the private savings of the future entrepreneurs and their families.

> We did not have a lot of money, all of us had a few. But there were also those of our fathers. Like the others, I went to my father telling him: "look, daddy, this is what I want to do", then, since he also had some savings, we put them together and started to consider how to invest them. (Testa, p. 64)

However, after having witnessed the potential and occasions offered by the new industry, also the rural bank became less suspicious and interested in the business. In this regard, during the process of gathering of local resources, and redistributing them in the form of particular loans for the emerging enterprises, the bank largely shared the risk with the new entrepreneurs, and developed financial contracts specifically aimed to meet the needs of the new entrepreneurs. In addition, the bank assumed, from the first moment, a sort of coordinating role concerning the economic activities. This role of the bank was particularly needed and important, since neo-entrepreneurs, fiercely production-oriented, often lacked in basic managerial skills and competences (Belfanti, 54).

Being the large majority of entrepreneurs from rural background, first firms were often set directly in the farmhouses where they lived with their families, there, it was possible to locate the new machineries in - already available -spacious infrastructures, having previously another usage (like basements, barns and sheds). In this way, early years of industrial activities could be conducted in parallel with agricultural ones for a better sustainment of the business (Testa, p.60). Furthermore, this new model of industry required more simple and divisible tasks, which, with few training, could be carried out, indifferently, by different members of the same household (Testa, p.62).

> Some friends of my younger brother had already quit working for Noemi and were unemployed (…) My brother told me that, instead of continuing with agriculture, he was eager to change job. Thus, he worked 3-4 months in another firm just to gain some experience in the stocking sector. Thereafter, we bought 15 machines, put them in the stable, and they started to work in collaboration, the two brothers and him (…) We had to put all the money to buy machineries, since they (the two brothers) have none (…) When my brother left for the military service I had to take care of the business (…) after two years he wanted to start

> business with me (…) therefore, we started, me and my brother (…) our rural house became the firm. (Testa, p. 60-61)

> I would not have made it if it was not for my parents, they gave me the strengths and support to begin (…) Not only with words but with facts. My mother helped me with my daughter and my father helped me, when he had time. They gave me economic, moral and manual support. (Testa, p. 62)

> If a woman had to stay home to look after the kids, then her mother could help her with the housework and she could, in turn, sew for some ours (Testa, p.61-62)

In addition, especially after the second half of the 60', started birth of a multitude of home-held and piecework textile laboratories that rendered more efficient and flexible the production, by accomplishing the growing demand of products of those years. These activities, which were usually held by one or two self-employed owners, grew in the neighbourhood of larger stocking industries and were specialized in supplying the latters undertaking one or few steps within the production chain of hosieries. These were, in short, the first workshops of subcontractors focussed on outsourcing, in which in the years to follow, rested also the true strength of the industrial district (Arrighi). At the base of this entrepreneurial energy, which was generating quickly start-ups on the territory, there was prominently a process of emulation ascribable to the particular ethic of work and sacrifice typical of the area. Individuals incessantly pursued the amelioration of their personal economic conditions along with that of their family and through their entrepreneurial success it was affirmed and improved their social status (Testa, p.62).

> There was this proliferation of small artisans, who it was possible to meet and know, it was a competition and confrontation between each other. You could observe them starting their firm and grow their business. I was a challenge against you and against the others. Let's call it challenge, competition. That is how we started. This triggered the initiative. (Testa, p.63)

This said however, despite the impressive growth of the district in both number of firms and wealth, some problems affecting the deep nature of the industrial district became evident also to the experts studying the situation at that time. What was clear, from the very beginning, was, in fact, the too basic only production-oriented nature of the district, which, despite its formidable potential in terms of stock, workforce and export, was lacking any kind of real coordination between its actors (Arrighi, p. 165). In addition, firms were almost completely dependent from specialized wholesaler located in other places (like Milan) for the trade and collocation of their products. This lack of structure was evident in 1962, when a short crisis affected the recently born district caused by the fierce competition of the German industry – which was more organized in terms of contracting and helped its the public apparatus- (Leoni, p. 89). The district managed to overcome these problems mainly by progressively attracting the attention of international buyers and by increasing its notoriety. This was also possible thanks to the setting up in Castel Goffredo of an annual "Sock's International Fair 1964"

(Mostra Internazionale della Calza) mostly organized under the pressures of the local bank, which, despite its short continuation- in fact, the fair stood for only four years, then failed for the problems found in its organisation (Arrighi, p.164) -, was able to put in contact local entrepreneurs with major producers and stockists. From the late 60' are seen starting also the first researches conducted on the district, stillmostly committed by the bank in association with some firms. However, what remained clear, also in the years to follow, was the too fast rise and sprawl of the district, of which the growth in size and wealth was not really accompanied by the development of overarching structures, collective action or entrepreneurial profiles (Leoni, p.91).

Studies on the population of firms

According to our data collection, starting from 1957 the number of firms in the district increased sharply. Within a period of 18 years, the total number of firms in the area subscribed to the hosiery-socks textiles sector, passed from less than one decade to more than three hundreds units in 1974. Precisely, 1960 is the year in which is recalled the highest peak of entries occurred in the period. The majority of firms were enlisted as stocking industries, and went to locate within the municipal area of Castel Goffredo and in the immediately neighbouring towns. By observing from the registers the spatial distribution of new start-ups, it is observable how the development of the district takes shape on a more circumscribed area compared with the previous period with the large majority of firms going to locate in the direct neighbourhood or vicinity of Castel Goffredo.

Overall, the total number of firms in this period is seen increasing constantly and sharply with an average of 33,9 firms entered per year and a 16 of closures. The only exception is represented by the period 1962-63, for which is observable a slight contraction in the total number of firms in the district, this probably in concomitance with the small documented crisis caused by German competition. After this ephemeral episode, however, the district's population will grow –although not steadily, but with different degrees depending from the period- for almost 20 years (until 1982). However, when considering only the population of firms recalled has "proper" stocking industries the entity of shakeouts is much more evident, and leads the trend to a decrease in the total number of firms for three times (1962-63, 1971, 1974). In this sense, average turbulence rates indicate that the cluster was characterised by a particular vitality during this stage. The period going from 1957 to 1974 is the highest for what concerns the volume of units, registered as stocking industries, entering and exiting the net market, and it exhibits an average turbulence rate of 0,2069 (the highest, considering all the four phases analysed in this report). In the same period, also the turbulence rate of the overall cluster appears to be fairly high, at 0,1402, and the entrepreneurial activity increases

considerably after the late seventies, with the progressive entry of early small firms and laboratories.

Codes from interviews and focus groups

They used to say that, in Castel Goffredo, there was a nylon thread as sauce for lunch-pasta's …all of us made socks… (Focus group 1)

…after, first circular "gadgets" began to appear…in slang we used to call them gadgets…it was something that was not extremely difficult to handle…(Focus group 1)

The socio economic substratum was characterized by a rural economy were there was a parcelling of land property…but there were also larger land owners who permitted to give breathe to economy. Thus they had the economic resources to develop what became, further, the district…(Interview 1)

My cousin was already thoroughly qualified…here many began like this, they were mechanics in other stocking industries, then they started their own activity… they came from a firm and then started alone…the district was born like that, understood? (Interview 4)

(my) stocking industry came into being in the same way Castel Goffredo did. Since there were two ex-employees of NOEMI…who put hands and head into that…who put the money, was doctor Pisi… (Focus group 1)

In the sixties there was the first "Convention Exhibit of the Sock"…many entrepreneurs were coming also from abroad…this means that Castel Goffredo had already became a cornerstone, a centre of importance…(Interview 1)

…they were aware of the district…but they also understood that this system developed too fast…it was lacking too much for what concerned organization…(Interview1)

5.2.2 Analysis

The fragmented growth of the cluster

It is impossible to deny the fact that the success of Castel Goffredo's district in its growth phase is not ascribable to fortunate facts exogenous to the district. As argued, the growing demand of women textiles, in the years of post-war, increased the overall number of activities and manufactures connected to this sector of industry. The trend of growth continued for at least two decades and it was, in other words, the early life cycle of the of the trading good and industry. In this regard, the production of women's socks had alternate moments, and this largely depending from the fashion trends of different periods (the promotion of the miniskirt

was, for example, one of the early key factors). Thus, the creation of first firms in the district was largely driven and after supported by the favourable macro-economic assets of the "Italian Economic Miracle" with its benefits on the larger scale on the national industry.

However, while such events could explain the success of the area in terms of mere regional economic performance, the reason for the particular fragmented and decentred development structure are instead to be found in path-dependent and contingent factors peculiar of the territory, in which the innovation emerged. The creation of the system of Castel Goffredo as a plurality (instead, for example, of an industrial reality more associative and based on mono-structures) is, largely to be imputed to the specific financial, social and cultural assets, present on the territory prior to the incoming new industry. In this regard, the technological innovation of circular machines was not only an advantage in terms of performance, but was also crucial since by fitting into the socio-economic tissue of the area it actively framed the type of development of the area.

Firstly, circular machines much more automatized, they required a modest amount of training for their usage (many competences were already present on the territory), they could be handled individually and, although their quality of production was, at least at the beginning, questioned by a large part of the sector, they were surely much more productive in terms of stock. Interesting is to note that the circular machines, which made the fortune of the district, were, at the beginning, largely neglected by NOEMI and by other industrial realities, which were already well-established in the sector in Italy and in Europe. By choosing (almost "under fire") the way of individual production, Castel Goffredo's entrepreneurs chose, with the advantage of the first move, an innovation that other regions were not able to exploit due to a sort of "lock-in and myopia" (or more general incompatibility with their current assets). A small stocking firm employing such machineries was best run by a handful of individuals with highly flexible tasks. In this case, organisation of nuclear rural families served the purpose well.

Secondly, differently from previous stocking machineries, circulars did not need huge investments for their purchasing. On the contrary, privates could afford them with relative ease especially if backed by the financial help of their family, relatives or particularly trusted people - with whom it was eventually possible to start a collaboration-. It is understood that the territory was overall sufficiently endowed with financial capital. However, this was parcelled in the various familiar units who, despite differences in patrimonies, could afford a limited number of machineries and did not stood a chance of taking over the whole industry. Similarly, being circular machines of small size and not cumbersome, the territory had a particular advantage for what concerned its infrastructural endowments. In fact, ample indoor

spaces present in almost all private farms and barns were quickly convertible in engine rooms (a thing that probably would have been much more in a urban environment).

Lastly, but not less important, such machineries permitted, differently from the previous mono-structured industrial implant of NOEMI, a kind of business which, in organisational and social terms, was much more similar to the centuries-old rural economic tradition of the area, based on sharecropping, self-entrepreneurship and family business. Thus, it is little surprising that with the arrival of such innovations, activities tended to sprawl rather than finding a more associative structure.

In a nutshell, by lowering significantly the entry barriers in the stocking industry, in terms of human capital, investments and infrastructures, the nature of circular machines restored the socio-economic environment typical of the area and allowed for that kind of flexible micro-entrepreneurship, which will characterize the district also in the years to follow.

Exploitation and nature of the district

An analysis of the information and data gathered suggests that this period of districts's development is essentially an exploitation phase. The number of firms grows sharply as the employment rates; huge profits are made accompanied by an atmosphere of optimism, which contribute to maintain high the trust between actors. In the process of growth the cluster starts to attract the attention of actors exogenous to its entity (institutions and the local rural bank) and gains more awareness of its existence. The fact that the cluster follows a highly concentred growth in this period (within the closest neighbourhood of Castel Goffredo's municipality: Zone 1 and, to a lesser extent Zone 2), might show the still rather place-bounded information and knowledge about the industry, which, at that time wasdowry of a limited amount of individuals who had experience in the field. Although the system is constantly affected by periodical crises,it is constantly able to recover,and this period is, so far, probably one in which the resilience of the system - especially meant as capacity of recovery from shocks- is fairly high.

However some problems linked with the deep nature of the district are in many regards already visible from this early stage. What became immediately clear also to the eyes of the experts was essentially rural nature of the recently developed system. Firms were, in effect, rather opportunistic and individualistic in their actions and notwithstanding the benefit coming from joint action (as those brought by the international socks fair) they remained reluctantabout such sort of initiatives. In short, their advantage was deriving more from fierce

hard-work competition than strategic action. Linked to this, was probably the fact that the cluster did not develop (as other Italian districts growing in the same period) any kind of structure or facility aimed to reinforce its innovation system or specific education. Firms themselves became the structures in which know-how was transmitted, while innovations of more technical nature continued to be furnished by the neighbouring Brescian mechanical cluster.

5.3 Third period: Expansion, apogee and sub-contractors (1975-1987)

5.3.1 Field research

Reports' analysis

Approximately from the middle of the seventies, begins what is probably the phase of apogee for what concerns the industrial district of Castel Goffredo, which will continue for some years, accompanied by an impressive development of the subcontractor enterprises. In such scenario, small enterprises rose in their number and specialized further. By their side, instead, larger enterprises aimed to expand their business, firstly by refining their commercial skills, and, in a second moment, by incorporating the functions that were previously outsourced to subcontractors and domestic local workers. In 1975, in concomitance with the decline in socks production of European countries - like West Germany, Netherlands, France and United Kingdom - there was a sharp increase of the Italian one, with a large part of the entire stock manufactured directly by the district of Castel Goffredo (Testa, p. 59). In addition, more prominent and export-oriented enterprises, located within the district, started to take into more consideration also the national domestic market. In such instance, the frame of Castel Goffredo, based on outsourcing and subcontractors, and unrecalled workforce, resulted victorious in respect of many other productions, located within and outside the country (Leoni, p. 95). However, especially when considering internal assets of the district, what became clear soon was that the situation was not without problems. There were, in fact, several complications linked with unreported and illegal employment, as well as problems linked with underpayment and overexploitation of the workforce. This situation generated ulterior lacks in organization and a frequent surplus in productions. Consequently, Castel Goffredo's entrepreneurs had to defend their position and reputation against global competitors that, in the light of above discussed problems, accused for more than once the district of "unfair competition", and claimed protectionist measures from the European Economic Community against it (Leoni, p.95-96). Although Castel Goffredo's entrepreneurs won the lawsuit with relative ease, what became clear was that the situation urgently needed

regulations. For this reason, it was enhanced the start-ups of new (and registered) specialized laboratories in the "peripheral belt" of the district. This policy was implemented with the help of local institutions, that declared the municipal areas bordering Castel Goffredo favoured by fiscal reliefs for the foundation of new firms (Leoni, p. 96). The result of such measures was an increase both in the total number of new enterprises and number of employees in the sector, accompanied by the emergence of a constellation of firms and small businesses in the outskirt of the district. Even in this years, the key to district's economic performance was sill the decentralized structure of production, which granted particular efficiency and flexibility to the system. This in combination with enlargements and upgrades of existent firms' machines' inventory made with the consistent revenues obtained during the previous decades (Leoni, p. 97). The renewal of machineries was widespread within the district, since the entrepreneurial culture of the area based on family business and close relation with the local community had the effect of enhancing particularly the competition between actors.

> Envy between entrepreneurs is a good one. It is a little bit the confrontational spirit, which led them to become bigger, little by little. It is this envy -which is essentially part of the entrepreneurial culture of emulation- that positively pushes to become better than "the other" and, all in all, brought many benefits. (Testa, p. 62)

The division in scale of the productive process in small units, also permitted a better control of products quality, which was checked at every different phase of the production chain (Testa, p. 36). It was thanks to this assents that district managed to reach particular advantageous and balanced price-quality levels in the production of hosieries, making its goods renamed in the sector, and consolidating its central position both in the Italian and in the European textile economic landscape. The district consolidated as an ensemble of productive units simple, elementary and decomposable; based on the integrative nature of the product's fabrication; not in need for particular organisational assets for functioning; and finding in the renewal and update of circular machine its first pillar of efficiency. In this sense, it was a rather autonomous system, hardly inclined to accept exogenous regulations or plans from institutional or collective actors, which often resulted unimplemented or not efficient (Cip. Pol. Gal, p. 92).However, this situation of footloose growth was not destined to endure.

In fact, already from the late years of the decadethe demand of hosieries was weakening due to factors ascribable to the partial saturation of the internal market.This situation began to challenge firms which were lacking the necessary requirements to compete on the global scale, leading them to become more fixed in their relations of subcontractors; be absorbed by local competitors or other firms; or, more simply, be ruled out (Leoni, p. 98-104; Arrighi, p.172).Despite the growing number of enterprises entering the district's net-market, the

relations between firms on the top of the productive cycle and subcontractors were turning from plural and horizontal to more fixed and hierarchical, giving priority to reliability and formal contracts rather than flexibility and trust (Leoni, p.97).In other words the district had suddenly began its path toward verticalisation. The centralizing of the entrepreneurial power in the hands of a progressively more limited circle of firms was enhanced by the progresses in automation and computerization, since only larger investors had the possibility to invest sufficiently in the new technologies and internalize the majority of functions. Moreover, larger enterprises, thanks to visibility and superior organisation, were facilitated in facing the new challenges presented by a market, which was becoming increasingly more open and global. This changes happened so abruptly that, in 1978, the major industrial complexes, working at the European scale were influencing directly with their activity the whole evolution of the entire district's system.

Apart from reorganisations, however, both small and large firms focussed their attention on the opportunities represented by brand promotion, improvements in the quality of products, direct relation with customers and, chiefly, the orientation toward the added values of fashion. For this purpose, they had to progressively develop internally those managerial and commercial abilities that were previously only better left to external intermediaries(Leoni, p. 98).On one side, predictably, larger enterprises tended to amplify the colour scale, and embroideries available on their pattern book –thus, enhancing their variety-, plus, they backed their export-based strategies with increased managerial skills, massive brand-promotion and advertising campaigns. Oppositely, entrepreneurs of smaller businesses, instead of pursuing an explicit "strategy of conquest", chose instead paths more inclined to sustainability and survivability. As such,they cured much more their direct relationship with buyers, by focussing often on single steps of production, on which, they attempted to maintain, in respect of lager firms, a major flexibility in terms of commitments and innovation.

Thus, through the eighties, the firms' on-going process of verticalization went along with another of specialization of local services and the district acquired the systemic assets that will characterize it also in the following decades (Leoni, p. 98-104).Many were the specialized facilities that developed with the aim of supporting the activity of the local enterprises (specialized: construction building, electric implants, water-supply, mechanics, etc.) and that became peculiar of the territory. This limited, de facto, a too high dispersion of activities in other areas and contributed to reinforce the specificity of the area (Arrighi, p. 172). Starting from 1986, the local bank also raised a series of initiatives aimed to improve firms' managerial competences by furnishing them the necessary information and updates concerning the stocking industrial sector (especially hosieries) (Belfanti, p.).

Studies on the population of firms

Within a period of seven years, the population of firms is seen practically doubling, shifting from the 335 units of 1975 to the 650 of 1982. However, immediately after this phase of "explosion", the district suddenly experienced a considerable five-years-long shakeout at the end of which the total number of firms was seen declining of about fifty units (598 units in 1987). In the process, the pattern of growth appears to be much more dispersed compared with the previous period. The majority of start-ups (a total of 72,49%, with 27,63% zone2, 17,22% zone3 and 27,63% zone4) went to locate in the municipalities surrounding Castel Goffredo or "relatively" far from the centre, only a 27,51% located in the core-municipality. Following this, it is observed that the district displays high levels of turbulence for all the period taken into account, reporting an average annual indicator of movement in the net-market of 0,2898. Among all the periods analysed, this is, in effect, the one witnessing, in general, the majority of turmoil and dynamism, considering the levels of entrepreneurial activity. In line with the demographic trend of firms' population, while the effectiveness of turbulence results highly positive in the early years of the period, it abruptly turn negative, after 1982, for a period of about five years. Again, and even more than in the previous period, an important difference should to be observed when considering respectively those recalled as stocking industries displaying multiple functions, and subcontracting workshops or laboratories, undertaking only specific steps of production. The turbulence of stocking industries, in fact, is esteemed during this stage 0,1491averagely, which, though not indicating a real phase of equilibrium, presents a considerably lower motility in respect of the previous period (in which it ranked at about 0,2069). The number of stocking industries, does not rocket in first years of this stage and the decrease after 1982 appears to be less sharp. In short, the population of stocking industries throughout the whole period appears to be much more stable both in terms of firms entry and exits, but still without exhibiting any kind of static nature or equilibrium.

During the years 1978-1979 it was esteemed that that district counted already more than 400 firms with at least 7000 employed in the sector.

Codes from interviews and focus groups

We must consider that the territory was labelled as a depressed area…thus, they (firms) "grew like mushrooms", since there were tax breaks, starting form the sixties-seventies…(Interview 5)

The firm was founded in the late seventies around 1977-78…before this date the firm was born as a stocking industry, but it was decided to change it completely, by focusing on yarns production…(Interview 3)

For Castel Goffredo is almost a "door-step selling"…deliveries are extremely quick…and we have everything under control…the one in Castel Goffredo is a very short supply chain… (Interview 3)

As a subcontractor I have an advantage…some of my competitors are not in the district and are located 40 kilometres elsewhere, but first they come to me, I am the nearest one…when you are subcontractor it is worth to stay in the district…it is a strength we have always had…(Interview 4)

In the stocking sector, our strength has always been differentiation…due to our rivalry, there is a continuous daily study around products, in here…when your neighbour is a competitor, who innovates better earns more…(Interview 4)

I could collaborate with many, as long as I did a completely different product and I don't cover their niche… but as soon as your product is similar to theirs, they cut off you, they don't look for a collaboration anymore… (Interview 4)

Union has never been our case…especially previously with all the money coming in from everywhere…just imagine…(Interview 2)

The relations with other firms have always been detached, unfortunately…after all, we are all done the same here…we always say I don't copy you, I won't…but… collaboration was few, and that turned out to be our weakness…(Interview 4)

This is an area of pure individualism…no discussions have ever been done around consortia, networks of firms, associations of business…meanwhile other districts have evolved in that sense…but we didn't…everyone had its small "fabbrichetta"… (Focus group 2)

I don't agree the decline in the number of firms was a decline in profit…it was, rather, a reorganisation…(Focus group 2)

Someone attempted to take control of all the market, becoming "mega", therefore the "bigs" crushed the "smalls"…then also, globalization prevent the smalls from exporting…where do large foreign buyers address their attention? To a large enterprise, to a prestigious name, therefore, small firms…just started to match the orders of larger firms…" (Focus group 1)

Our job is, first of all, seasonal and dependent from fashion, therefore crises have always happened…when pantyhose weren't needed anymore, they started to put trousers…downfalls are normal for us…(Focus group 1)

In 1975 someone was already rumouring a crisis…(Interview 1)

To be fair…I have some documents witnessing the fact that, in 1977-78, they were already talking about a crisis…40 years ago…(Interview 5)

5.3.2 Analyses

Between growth and maturation

Through an in-depth analysis of the period between 1975 and 1987, it observable the clear shift from a pattern of much more uncontrolled and "footloose" growth to another oriented toward specialization and selection of firms. However, this change is not seen happening overnight, and the separation between the two stages of growth and sustainment/maturity does not appear to be neat. This is even more evident when following the insights of life/adaptive cycle theories on clusters. What appears, rather, to be the case, is that different patterns of evolution, ascribable respectively to growth and sustainment stages of a cluster, seem to coexist in this life-phase of district's development.

On the one hand, the district displays, for the whole period taken into account, high levels of turbulence in the entrepreneurial activity (as we pointed out previously, the highest recalled for Castel Goffredo's life-cycle) typical of a growing cluster. The total number of firms in the district, after having rocketed from the early seventies and peaked in 1982, quickly decreased in the years to follow, exhibiting a high number of both entries and exists in the process. Interesting is to note that, the number of start-ups never corresponds to the one of shut downs, hence, at least from a firm-demographic perspective, this period still resembles more a canonical growth stage and is hardly interpretable as any kind of equilibrium or zero-sum typical of a sustainment. This trend is probably explainable by the fact that technical knowledge and competences, inherent to the sector, were, in this period, dowry of a vaster pool of skilled labourers on territory, that (after almost ten years of apprenticeship and learning-by-doing), were in their turn eager to start their own business and enter the net-market. For the same reasons, the development of the cluster appears as less centred, compared to the previous decade. Moreover, this "second growth" was propelled by the particular hosieries' industrial cycle, characterized bythe decomposability of the production process, which favoured the birth of a multitude of micro-laboratories specialized in one or

few stages of production. During a situation of constantly high demand (which, as said, stood approximately until the 80) the role of subcontractors was mainly to supply other firms by working on commitment, and this prominently by working with occasional and often informal contracts. In so doing, especially small firms were likely to engage with several outsourcers (also at the same time) since needing their work and expertise, but without a clear scheme of hierarchy or priority. Thus, commercial relationships among firms internal to the cluster, tended to remain highly flexible for the majority of the period taken into account and, only further, to became slightly more rigid and verticalized, under growing pressures of declining demand and global competition –this, reflected in the fairly sharp decrease in number of firms occurring after 1982-.

On the other hand, there are other patterns in this phase, which lead, instead, to foresee a perspective of maturation, specialization and conservation of the district, namely: the strong regional bias and support of institutions, the advantage gained from external networks of commerce and first rumblings of a cognitive lock-in. To start with, it is clear how the size and visibility acquired by cluster, as a system, were at this time, sufficient to shape the regional landscape in a broader sense. Besides the specialization of various service sectors located in the area to the needs of the stocking industry, it is clear how institutions, in first person, were involved and played an important role in this phase of district's life-cycle. Firstly, institutions contributed to implement fiscal breaks in the peripheral municipalities, in the outskirt of the district. Secondly, first projects about the creation of an R&D centre were realized with the combined efforts of both the local bank and different institutional layers. Overarching structures are therefore seen displaying a clear awareness in respect of the consolidated identity and potential of the industrial district, which, due to its increased size and visibility, is in this period able to directly influence and condition the nature of the region. In second instance, an additional feature, reminding maturation, could be noted if considering the growing interests of firms for linkages external to the cluster. It has been pointed out previously how, notwithstanding the early export-oriented vocation, the district used to make large use of intermediaries for its exports in the previous stages of growth. The commercial network of clustered firms was, in effect, mainly inward-looking, and precisely aimed to reach a sort of balance between cost and production. Consequently, it is only from this period that a certain number of clustered firms – possibly, only those with the adequate means- began to seek actively the advantages given by improved managerial capacities and by direct commercial linkages with the outside. Finally, it is recognizable that, right in this period, the cluster reaches a sort of cognitive maturity in relation to some technologies and competencies, which made it grow impressively during the previous decade. Thus, starting on that process of incremental specialization, which will accompany it also in the years to follow. In this regard,

in view of the diffusion and consolidation of the competences/technologies linked with stocking industry on the territory, and after the focussing of firms on various micro-processes of the chain of production, the strategy adopted to keep pursue with the incoming challenges from the market, was mainly the one of fashion orientation and product upgrading. In order to remain competitive, in a situation of decreasing demand, firms started (independently) to improve, still further, their competences on frontiers like: quality amelioration of materials, computerisation/automation in the efficiency of production and sensibility toward the consumer in terms of fashion and product promotion. In such context was founded the new R&D facility Sock Service Centre, which was alleged to undertake a function of analysis useful for the whole district.

All in all, it appears clear that, during this period of evolution, features from both life-stages of growth and maturation coexist in the development of Castel Goffredo. In terms of life-cycle the district was in effect able to undertake, in the late seventies, a second period of growth, which increased size and visibility of the cluster, and made possible to partly shape the region itself. However, it is also observable that, after this "flash in the pan" the district was not able to achieve that status of countinous mutation and dynamicity that would have permitted much more flexibility and adaptability in the future. This fact is probably partly imputable to the nature of the industrial district, grown extremely fast, completely based on manufactures, lacking analytical knowledge-bases of economic actors and, therefore, disadvantaged in shifting concretely into new sectors of production. The table below resumes what has been discussed in the paragraph.

Cost-leadership and product upgrading

It is observable that the two evolutionary factors protagonists of this phase of district's development are clearly cost leadership and product upgrading. As recognized by many scholars, such evolutionary are common in maturing clusters, since straightforward and easily implementable. However - still following the insights of evolutionary economic geography - and literature on districts' life-cycle -, there are evidences that these are among the evolutionary factors most likely to conduct industrial clusters toward rigidity and further lock-ins.

As understood, during the 70' the district of Castel Goffredo was in effect able to achieve the European hegemony in cost-leadership for what concerned the production and commercialization of hosieries. In this instance, during the period analysed, it might be speculated that the cluster presented those characteristics of plurality, horizontality and flexibility, also typical of other contemporary Italian IDs based on manufactures, which determined the widely studied Third Italy's "Golden Age" (Garofoli local system). The

enlargement and empowerment of the district was possible thanks to various factors, namely: the increasingly more diffused technical knowledge on the territory; the help of local institutions which lowered tax pressures in the periphery; improvement of managerial skills for trade; high competitiveness of district's firms within and out of the cluster; and last, but not least, also by an "excessive flexibility" in the labour division, that often resulted in unregistered (and, therefore, untaxed) local workforce. However, even though such assets determined the flourishing of the district, the success of cost-leadership led economic actors (private and public) to focus increasingly on a myopic and path-dependent trajectory based on cost reductions and production upgrades in the very same sector). Thus, the sector became weaker in view of a future global competition from countries with lower costs of manufacturing. Moreover, if, on the one hand, the division of labour, in a multitude of family-based medium and small enterprises, enhanced flexibility and competitiveness, on the other hand, it increased individualism and the fragmentary nature of the system, this also because firms were not likely to engage in networks beyond the mere commercial contracts. In few words, we argue that the inclination toward cost-leadership also reduced significantly the capacity of firms to perceive a concrete possibility for collective action, something that will be much regretted in a future.

The second evolutionary factor, involved especially in the later part of this stage, was differentiation, which mainly took shape through a product upgrading and fashion orientation. Again, notwithstanding the effectiveness of such strategy - in fact, after the eighties for two decades, the district was able maintain its position of leadership in the sector, and stem the rivalry from oriental countries with relative ease -, an a posteriori perspective might suggest that also this specialization came at a cost. Firstly, relying more on fashion, as main instrument for growth, exposed the district to a rather uncontrollable uncertainty, in which, the fortune of the sector was largely decided distantly from the district itself. Secondly, it became clear that the path chosen by the district was increasingly becoming the one of incremental innovation in a particular sector of industry. As documented by many scholars, specialization is likely to occur in maturing industrial clusters, since it permits a major competitiveness of firms on the market, however, too much focus on a narrow trajectory may decrease the chances for radical innovations and change of the industrial theme in a future

In sum, although cost leadership and product upgrading contributed respectively to make and maintain the fortune of the district, "success carried seeds of destruction" by reducing internal variety. In particular, it is observable how the district dived headfirst in empowering respectively synthetic (for what concerns technical and commercial abilities) and symbolic (for what concerns fashion orientation) knowledge in terms of hosieries' production. In addition, the strong fragmentation given by the particular morphology of the district impeded,

at the same time, to enter effectively in a proper period of maturation with more consolidated networks, awareness for collective action and collaboration among firms. The system remained essentially of peripheral nature and notwithstanding the slight verticalization and reorganisation, connectedness in the system remained quite low. In conclusion, our claim is that: although the district, in this period, was apparently far from any kind of demise, the process of rigidity-increase and resilience-decrease, which will bring, later, the cluster to a decline, was already begun.

5.4 Fourth stage: apparent stability and internationalisations

5.4.1 Field research

Reports' analysis

During the 90ies decade with the progressive opening of global markets the district of Castel Goffredo continued to develop by specializing in productions, empowering machineries, by increasing the export on international markets and by promoting quality brands (Cip. Pol. Gal., p. 36-43). It is understood that, in these years, the overall demand of hosieries products presented still remarkably high levels, but, at the same time, much more stable patterns compared to previous decades. In fact, if on the one hand globalization had notably the effect of enlarging further the possibilities of commercialisation and opening of new market channels, on the other hand other factors of various nature started jointly to contain the booming trends of consumption characterizing instead the previous decades of development. Some of these factors were, for instance: the progressive semi - saturation of the internal national consumption -, which already presented decreasing trends in the last years of the decade (Cip. Pol. Gal., p. 61-62); the improvement in the quality of fibres and threads' materials that basically rendered hosieries much more resistant and less likely to be replaced by users;the changes in the apparel, that stopped hosieries from being a garment constantly present in the ordinary female's clothing, and increasingly oriented the latters to become an accessory essentially related to fashion's trends and choice (Cip. Pol. Gal., p. XXIX-XXX);and, probably not less relevant, was also a sensible increase in the global temperatures that directly led to a decrease in the consumption of these products - especially during the seasons of spring and autumn. Thus, following studies in the sector, it became clear that - especially in developed countries - hosieries had reached a sort of maturity in what was the product life-cycle of the consumed good which,

although still far from the "turning into stone" phase, could not anymore enjoy the spontaneous growth typical of the initial stages of its diffusion (Testa, p. 146-154).

In order to avoid saturations district's firms increasingly focused their strategies on the exports in foreign countries, targeting especially the channels of Old Europe and the recently opened markets of ex-socialist countries.Remarkably improved in quality and notoriety, the products of Castel Goffredo progressively occupied also those niches that were previously traditionally occupied by foreign specialized European textiles, in the meantime, first global competitors from developing countries started to emerge worldwide and went to occupy the less qualitative-oriented productions of the sector (Testa, p. 99-133). Given the supremacy of district's firms in terms of technology, expertise and presence on markets the arrival of such new competitors did not seem to concern excessively local entrepreneurs and organisations for the future of the business. In effect, through new continuing investments in the rolling stock of firms, texturing efficiency of twisting machines was more than doubled and new machineries were introduced automatizing also the phase of confection – traditionally labour-intensive (Leoni, p. 118-120). Surveys conducted on the district in those years demonstrated that circular machines used in the environment of Castel Goffredo were, on average, superior in terms of efficiency and quality compared to those used in other similar industrial contexts (Cip. Pol. Gal., p. 53). Both small and larger enterprises increasingly focussed on improving their managerial and marketing capacities through the promotion of firms' own quality brands and by the computerisation of industrial catalogues available also through the Internet (Leoni,). Moreover, in very last years of the decades (around 1999-2000) some firms were already starting to differentiate more significantly their offer by moving on new textile products different those of the stocking industry. Precisely, some among the major firms were starting to launch knitwear and underwear products realized through the technology of seamless. Also in this case the passage was possible thank to the collaboration with the neighbouring firms of the mechanical cluster of Brescia that effectively developed the new devices needed, essentially relying on the same technology of twisting machines (Cip. Pol. Gal., p.). In order to achieve such new productive assets some of the most prominent and large enterprises were already locating part of their branches in European emerging countries (chiefly in the Balkan area), the phenomenon of relocation, however, still did not appear as a particular threat for the integrity of the district as a system. In fact, given especially the prominently local and familiar nature of businesses, few actors saw a concrete advantage in the total displacement of established activities and, albeit competitive regimes had effectively

increased between firms, only a 3% of entrepreneurs were planning to dismiss employees in the near future (Cip. Pol. Gal., p. 43). On the opposite the presence of unreported employment and "moonlighting" became less important within the district in this years in concomitance with a more regulated and organized modality of production (Cip. Pol. Gal., p. 26). Overall, the district consolidated its dominant role in the stocking industry and acquired additional visibility, at the same time, however, it had to progressively re-organize its internal structure. The process of verticalisation already started during the previous decade continued even more marked during this period. In order to better cope with new macro-economic challenges at the global scale, district's firms increasingly organized in business groups in turn guided by major "chief-firms" (Cip. Pol. Gal., p. 87-88). Thus, while many entrepreneurial units continued their activity based on subcontracting as rather independent subjects, some others were bought or became informal branches of other firms that invested considerable amount of capital in the direct renewal, management and coordination of the latters. However, it was reported that the prevalent form of organisation gaining ground among district's firms was an intermediate one, represented by the so called: "recurrent contract", through which also independent subcontractors tended to form more solid relations only with a limited number of clients in order to achieve a superior accountability and trustworthiness in productive commitments (Cip. Pol. Gal., p. 47-50). Thus according to expert's analyses the district continued to develop following the lines of selective cooperativeness; mediated competition between actors; efficient reductionism; and relational density characterized by "hot communication" (Cip. Pol. Gal., p. 82-85). In short, in the late seemed to have reached a sort of balance between its horizontal and vertical dimensions, which appeared as destined to endure also in the years to follow (Cip. Pol. Gal., p. 107-108).

Along with such adaptive changes, however, it was noted that main problems of the district remained linked to the limited capacity of local actors to join collective projects of development of medium-long term (Cip. Pol. Gal., p. 30). Precisely, the presence of institutionally mediated services continued to be insufficient in the case of Castel Goffredo. In fact, within the district remained quite rooted the "mentality of deregulation" sceptical in regards to external and top-down initiatives, that was alleged to have constituted the advantage of the system during previous years of development (Cip. Pol. Gal., p. 82). The building of more formalized channels and organisational structures for the creation and transmission of new knowledge in the system was neglected, favouring instead business groups, in which the role of innovators was

informally undertaken by leading firms in first place, with minor firms imitating or supporting the path created by most successful actors (Cip. Pol. Gal., p. 86-89). The local rural bank (later became the "Bank of Cooperative Credit") remained, so far, the unique intermediate actor able at best to condition, but not regulate, the complex dynamics of district's development (Cip. Pol. Gal., p. 86). Following such trends, also the levels of schooling of the actors employed in the district tended to remain relatively low even compared with other peripheral industrial realities emerged during the "miracle of Third Italy's development". Local actors, in fact, perceived that the experience obtained on field was much more valuable in comparison with other kind of educations obtained, instead, through formal education – it was estimated that approximately 74% of the entrepreneurs active in the district detained only the basic mandatory title of studies (junior high school, 8 years) (Cip. Pol. Gal., p. 28). In this scenario the local R&D facility Centro Servizi Calza (Sock Service Centre) was instituted in the early nineties (1990) on the initiative of the local bank, with a twofold purpose: the first aim was to create a sort of organisational pole and "collective subject" able to increase the capacity of firms about identifying themselves as part of a larger system-area; in second instance, it seemed worth to endow the district with an open research centre useful in the increasingly more challenging tasks of consultancy, analysis and promotion, linked to the specific sector of industry (Cip. Pol. Gal., p. 25-26). However, even seven years after the R&D's foundation (in 1997), only a 15% of district's firms were effectively consociated to the structure and barely a 32% declared to have used at least once its services (Cip. Pol. Gal., p. 29-30). Still following reports, emblematic was the manner by which the recently developed Internet technologies were by firms. In fact, in view of such new opportunities, the CSC proposed an experimental project based on the construction of a comprehensive and integrated catalogue on CD-ROM for hosieries products. When the project was accomplished, however, despite various appreciations, none of the firms adopted the latter. Rather, by following and imitating the example of first pioneers, firms started in turn to develop individually and internally their own on-line catalogues, a choice that led to exploit only partially the full potential represented by such innovation (Cip. Pol. Gal., p. 88-89). In short, it became clear to scholars and experts studying the district during these years that globalisation had not subverted the basically decentralized and horizontal structure of the district. Indeed, the increasingly more verticalized assets - thus witnessing the presence of leading firms more able to reach the opportunities of a global trade - undoubtedly helped the system to maintain its competitiveness in the global scenario. However, apart from the rise of business groups and the progressive affirmation of trade and labour associations, institutionally related

regulations and initiatives struggled to gain ground. This was evident especially in the strategic fields of education, training and promotion of technological know-how (Cip. Pol. Gal., p.85-86), where single firms continued to be, so far, the unique source of formation and innovation.

Studies on the population of firms

To begin with, compared to previous stages, this period sees a general decrease in the total number of both births and closures of firms. Start-ups, for the twelve years considered in this period, have been accounted for being 180 in total. Furthermore, start-ups return to concentrate closer to the historical "core" and near periphery of the cluster (32,78 % in the zone1, and 40,56% zone2) and involve in a lesser way more external areas. Accordingly, turbulence rates are also seen lowering considerably compared to the previous period, in fact, after the shakeout and verticalization happened in the first half of the eighties, the average turbulence rate is esteemed at about 0,0961 (from 1988 to 2000), thus, signifying relatively low levels of entrepreneurial activity in general and a certain stability. Nonetheless, from a firm-demographic perspective, it should be noted that this one is the first period, after almost 20 years, in which the trend of growth in the number of organisation becomes negative and the total number of firms in the district slightly diminishes. From the 607 units of 1989, the district decreased, within about ten years, of almost 60 units: firstly with a decline from 1989 to 1993; then almost stabilizing for about four years; and, lastly, again declining from 1998 to 2000, in a climax of decrease (exits overcome births, thus turbulence rate indicators of effectiveness are negative, and progressively diminishing: -0,0140, in 1998; -0,0281, in 1999; -0,0394, in 2000). According to our dataset, decreased affected in equal manner stocking industries and small laboratories, which were probably absorbed by other firms. This also permits to foresee the more sensible decline in the population of firms, incoming in following years. Finally, it is important to note that, despite this decrease in the number of firms/organisations, historical sources report that the levels of employment were in constant increase also during this period. The esteemed total number of employees in the district, only in the area of Mantua, was about 8000 in the early nineties and it peaked at about 8500 in 2001.

Also from a qualitative perspective, the period after the nineties presents changes and peculiarities, especially because the district started clearly to face challenges linked with global competition. In this instance, the district started to struggle in maintaining the leadership, remained for a long time undisputed, on international markets, especially for what

concerned the competitive price of its products. Emerging competitors, especially from eastern countries, were quick in entering the market of textiles and, therefore, also of the stocking industry, which was characterized by a relatively simple kind of production and low technology. In addition, helped by their growing economy, availability of resources and cheap labour costs, they did not have problems in replicate, and later overwhelm, some of the districts' ordinary productions. Thus, also reducing the efforts toward innovations.

Interviews and focus groups

We have been having a steady development for fifty years, but, sometimes, it is not enough…your efforts are worth six months, but, as soon as your easily-replicable product goes to China, or Turkey, they do it themselves and it comes back halved in its price…you don't have any strength on those aspects…(Interview 4)

I have never seen anything (help from institutions)…we have never been facilitated… the Turks have been really helped by the state, when they had to export…I hope our politicians will help us, sooner or later…(Interview 4)

They should put more limits and it would be good for work…until now limits have been put only to those who…you know…it is not thinkable that from the other side of the world everything arrives and, whenever you export, they block you everything…(Interview 2)

The characteristic of our production has always seen a division in the scales of industry…tailoring laboratories went out of market due to Chinese competition…or they were delocalized in places where labour-force was cheaper, like Serbia…this phenomenon was massive after 2000, but it began earlier… (Focus group 2)

*Many laboratories were undertaking only one of the production's processes …another problem was the uniqueness of some productions…the absence of diversification…(*Interview 1)

At the qualitative level the product has already reached its top earlier on…some investments probably might be done on communication or fibre…but the product is simple in itself …because of this, we (the district) are always quite restricted on this aspect…(Interview 3)

Small was good…there was a slogan: "small is good!!"…it was like that in the seventies, eighties …it is recently that the market has changed…what was previously an advantage became a disadvantage…also because the mentality remained the one of the small…(Focus group 2)

Some stocking industries have focused on seamless…however, also underwear has done its time, then it was saturated…there is few space left…(Interview 2)

They moved on seamless and Lycra…still based on circular machines…another innovation was the production of knitwear…however, it was more costly to produce it, since it was much more based on labour-intensive production…it was the first to be relocated…diversification was not sufficient…(Interview 5)

There was a lack of farsightedness…the rate of early school leavers in that area is one of the highest in absolute (in the province)…after finished the compulsory school…many of them started to work…others, in turn followed before finishing the secondary school, since they were seeing their fellows having more money in the pocket…until few years ago, there were very low cultural levels…(Interview 5)

Until now everything was fine…without a school, without a showroom, without a research institute, there was employment…of course, the crisis began long before now…(Focus group 2)

In the 90ies a technical textile school was founded, from 1995 to 1999…with a strong expertise focussed on the district…however it soon became a more generalist technical school…thus, with a contradiction, since students might have been employed immediately afterward… (Focus group 2)

Institutions…they did not see…still nowadays we have to pull them like extremely heavy carts…and, only recently, they are responding… (Focus group 2)

(For the bank) there weren't any problems until the 90ies, till…till the "Bocconians" arrived, then first "holes" began…it's a reality of Castel Goffredo… Bocconians start from the assumption that they are wise, but they are not in touch with reality… if it costs 10, and you spend 5, you must sell at 16…but you must sell 16 only if you are able to…otherwise you'd better cut your earnings… (Focus group 1)

The calza centre was an excellent intuition, and the bank and the province put money into that…then, sometimes things evolve, sometimes devolve… the bank, has devolved, in such regard…in last decades, due to its internal problems, it abandoned its previous role…(Focus group 2)

We always had to scrounge up…we don't use its (the Calza Centre's) analysis cause we are not consociated…the price of an analysis is expansive…I prefer to commit it to the firm which furnishes me the threads…(Interview 2)

The Socks Service Centre did not even subscribed the district to the Italian Industrial Distrct's Federation, located in Mestre…that says a lot about the situation…(Focus group 2)

The Centro Servizi Calze has a function but limited…(Interview 5)

Being located here or elsewhere would not make any difference…till now I have never seen the advantages of being located in a district… (Interview 2)

We had to be more united, instead we were not…obviously…everyone tried to "bring grist to his own mill"…a classic…yes, yes, let's help each other…yeah, right (ironic) …(Interview 2)

They were not able to build something together…there was an egoistic inclination in maintaining everything without socialising…it still exists… firms stare at each other and, if one of them closes, the others are happy…"mors tua vita mea"….(Interview 5)

5.4.2 Analysis

Between sustainment and decline

Considering the period analysed, it becomes clear that, the district, also in this step, exhibit characteristics of two different stages simultaneously: sustainment and decline. In fact, although the district was not (yet) perceived for being in an authentic crisis, we claim is that, already this period had some inklings of a change, which would have happened in the following years.

To start with, this stage of district's life-cycle begins with a considerable shakeout, happened during the previous years, which preannounces a phase more inclined to stability (T B). From a demographic perspective of the district this is, after emergence, a period overall characterized by low levels of entries and exits, with the formers almost matching the latters, hence, levels of turbulence remain relatively low and the system gives an impression of semi-stagnation (Menzel and Fornhal, 2009). Moreover, notwithstanding the slightly general decline in the number of organisations, this is the period in which the district reaches its higher levels of employment, which, following EEG's literature, is typical sign of a full maturation (Kohler and Otto,). In contiguity with the previous period, it becomes even clearer the process of cost reduction, reorganisation and upgrade in firms' size aimed to fit with global networks that become increasingly important. Finally, it is understood that, already in the nineties, the cluster, through processes of quality improvement and

differentiation, had definitely reached the "edge" of its sector, especially in terms of quality and technology, but, in parallel, it had also definitely locked its industrial thematic boundary.

However, by analysing the evolution also from another perspective – especially a more qualitative one- it might be observed how the district was already presenting, already during the nineties, some patterns typical of a decline phase. In fact, besides the slight but continuous decrease in the number of firms - which, although not affecting in a first moment the efficiency of the region, was already reducing the morphology of the district- and first phenomena of relocation in countries with lower costs, concrete negative sentiments began to emerge within the cluster (Menzel and Fornhal, 2009). It is evident that from this period many entrepreneurs start to harbour a grudge in respect of various institutional layers, from which they feel abandoned. Such sentiments are prominently toward a macro-level, thus national institutions, in which they blame a lack of interest in the exports safeguard. However, there are also complains directed to the conduct of local institutions, which they judge too loosely connected with the reality of the district and unable to help in creating a real possibility for cluster's knowledge update. Similar blames concern the local bank and its recent and direct creation, the R&D institute Centro Servizi Calza, since entrepreneurs soon recognized it as not crucial for their needs, or for the needs of the district. In turn, institutional (or semi-institutional) organs and experts studying the district, reciprocated such negative sentiments by evidencing the difficulty in promoting diffusion of knowledge and unity of firms, in such fragmented and uncooperative environment (thing recognized by entrepreneur themselves). Finally, for what concerns the variety of the district, starting from late nineties firms with possibilities diversified their products, for example by entering the market of knitwear and seamless garments. However, what is evident is that the district replied, again, to the challenge of global competition through an "extension of established trends" (Chapman et al., 2004), undertaken by few firm singularly, rather than a collective renewal of the cluster in question. In effect, no significant changes in production or radical technologies were introduced on a large scale (considering that, the technology employed for seamless' production was the same needed for stocking industry, based on circular machines) and, despite the attempt, the majority of district's firms continued their specialisation increasingly toward a narrower trajectory. In short, with more than 8000 employees in the stocking sector, it might speculated that, in the late nineties, the cluster had terminated its chances of becoming what in EEG's literature is defined as a "Normalregion" (thus, a region in which is present, rather than only one dominant or prominent industry, a variety in the economic landscape, see: Hassink, 2007), decreasing its resilience further.

Knowledge lock-in, low interaction, but high interdependencies

In fact, in this last stage analysed, the district had reached the assets preceding the crises of the future decade. According to our findings, and considering, in particular, the historical evolution of the district, it appears that the cluster was suffering for two different situations of stagnation, which were maturated in the past, and were partially linked with each other.

After more than 40 years from its birth, and after a long amount of time passed on refining the present industrial sector, it is understood (also from interviews) that districts' firms had definitely reached a sort of "top specialization" for what concerned their fields of production, which could only be undermined by the less proficient, but at the same time much more cheap, Eastern competitors. It is alleged that, at this moment, the majority of firms, present in the cluster, were still family based, and ran by entrepreneurs - mainly of first and second generation – and employees, who learnt their job "on the field", through mechanisms of learning-by-doing. In the decades, almost without the help of specific education or research structures, district's actors refined the technical and commercial abilities inherent to the niche they occupied in the sector. In this sense, firms themselves had always been the unique propagators of competences, and entrepreneurs were clearly in posses of considerable syntetic and symbolic (given the fashion orientation of some firms) knowledge in the sector, gained through experience and routine (Asheim). However, such competences linked to unique sectors were rather crystallized and specific and, therefore, hardly expendable and re-employable for other activities. In addition, differently from previous decades, the changed technological and macroeconomic scenario of the nineties - notoriously more selective and characterised by lower consumption demand - could not allow entrepreneurs to move easily in other productions or to penetrate new markets in which they were inexperienced. Thus, despite the signs of an imminent crisis, very few entrepreneurs and firms – regardless from their size - had the intuition, the willingness or also the concrete possibility to move radically in another fields of industry. Rather, they remained locked-in in even more desperate challenges of cost-quality and production upgrades against foreign competitors, and, more important, against each other.

It is in fact this second issue, linked with the connectedness of the system, which contributed to the definitive set-down of the future decline's premises. From our research, it seems clear that, during all the four stages analysed, the interaction between both organisational and institutional actors, forming the district, remained essentially low, if not negative at times. For the reason already explained in previous stages, firms also in this period never undertook a proper collective action -nor the lobbying, typical of mature clusters (Menzel and Fornhal, 2009)- and were rather rivalling. Furthermore, although institutions and intermediate

organisations had long recognised the importance of the district for the regional economy and helped its rise, the parties failed in creating a valid network of trust and innovation for a possible renewal and were clearly myopic in respect of the crisis, which was beginning to affect the sector. In other words, in terms of connectedness the cluster was always characterized by a "too weak lock-in" (the comparison is with: Hassink, 2007), which permitted, in a first moment, its flexibility, but also denied its full maturation. The district was apparently in a state of quiet, but its safety, as a system, was already undermined.

5.5 An historical perspective on Castel Goffredo: summary and interpretations

Evolutionary factors and division in life stages

From the establishment of the first stocking industry on the territory (the NOEMI) the district officially enters in its phase of *emergence*. The "official" and exogenous triggering factor of cluster evolution is therefore the establishment of a *foreign anchor-firm,* which brought new knowledge, technology and opportunities for business on the territory. However, relatively important were also the previous endowments and in particular the role played by *local institutions*since favoured starting conditions and the creation of the pipeline with an external regional economic environment, necessary for the birth of the first "mother firm". In this sense, the rise of a new industry in the geographic economic landscape in the landscape of Castel Goffredo appears as caused by a joint action of various factors, instead of an outcome from a single accidental event. Although it is assumed that, even before the birth of NOEMI, the activities linked with textiles were many on the territory, what seems to be the case is that this firm remained for a long time the dominant one, due to its superior size, technology adopted and competences of its employees. Only after the fifties - and precisely in the four years going from 1952 to 1956 - the difficult situation of the firm, embittered by the relationships between Oreste Eoli, his brother and the firm's employees, pushing the latters to hazard the opening of first small firms based on circular machines (which were already present among the implants of NOEMI and could be reproduced by the engineers of the nearby Brescia). In short, the stage of emergence comprises two different periods: firstly, a major one going from NOEMI's birth to its crises; and secondly, another, of about four years, in which few new firms start to grow in an environment of risk and uncertainty.

After 1957, the success of first pioneers becomes clearer to the local community, therefore, the population of firms begins to rise sharply. It is witnessed the growth of a multitude of stocking industries, based on the production of tights by means of circular machines, and led, in the majority of instances, by ex-employees of NOEMI -whose activities start by processes

of spinoff and imitation. *Technological innovation*, represented by the adoption of circular machines, is the main evolutionary factor protagonist of this growing phase: firstly, because, differently from previous implants, circular machines permitted the diffusion of the pattern of micro-entrepreneurship, typical of the district; secondly, the utility and potential of these new innovation were aspects largely underestimated in other regional economic realities, which did not manage to take advantage of it for their a growth or for an eventual renewal. It appears that the first agglomeration of firms tended to emerge fairly concentred geographically, probably reflecting the initially more locally-bounded nature of both innovation and information but also the inclination of first entrepreneurs to remain in the place where they lived despite the risk represented by an higher competition. This stated, it is should be recognized that another equally important evolutionary factor of this period is undoubtedly the increasing pattern of *demand growth* for what concerns hosieries' production. Growing demand contributed to maintain relatively high the survivability and success of start-ups, in addition to boost and encourage their entry. This first growing stage of development also witnesses the progressive involvement of intermediate actors, not strictly meant as part of the hosieries' industrial district itself, such as the local institutions, the rural bank and, mostly important, the nearby mechanical industrial cluster of Brescia, which started to interact for many aspects co-evolve with the reality of the newborn district. Overall, this second historical period of cluster development, going approximately from 1957 to 1974, resembles what is called a *growth or exploitation* phase of the district*,* in which new opportunities are seized and a cluster's identity is created. However, given the crises hitting periodically -and frequently- the district from its very beginning it is not completely possible to talk about a period of complete "heyday". In effect, the system appears poor health in face of sudden changes of the market –this especially due to the unpredictability of hosieries consumption-. Furthermore, the district is not particularly inclined to cooperation or combined efforts between actors for problem solving or to undertake radical innovations in both situations of affluence or crisis. In few words, as many peripheral industrial districts based on manufacture, the district displayed already from early stages a weakness linked to its profoundly "rural nature", that will remain unchanged also in the following years.

Concerning the period of district's development going from 1974 to 1987, data obtained from research tend confirm the fact that the district is entering in a new stage of development. Already from the late seventies the quantity of demand growth and consumption, though still considerably high, slightly begins to decrease and the district is challenged about finding new strategies in order to maintain high profits and performance. In such instance, what appears clear is that the main strategy adopted by the district, as a system, is the one of the *cost-leadership,* which is also the most prominent evolutionary factor of this stage. It is during this

period that the district manages to conquer, at the European level, its traditional dominant position in the textile sector of hosieries. This happens especially thanks to the characteristics and good repute of its products, which result particularly advantageous in terms of price-quality ratio. The supremacy in cost-leadership is achieved through various passages. In first instance, local institutions contribute to low the tax burdens on entrepreneurship in the areas contiguous to the municipality of Castel Goffredo. Thus, creating the favourable conditions for the emergence of a multitude of firms and laboratories, often specialized in one or few phases of the hosieries' productive cycle and subcontracting. The period is, in fact, characterized by extremely high levels of turbulence and entrepreneurial activity, especially for what concerns the entry and exits of smaller firms. In addition, the district expands geographically and the majority of start-ups go to locate in the peripheral areas, instead that in the neighbourhood of Castel Goffredo, thus, reflecting a more diffused know-how and awareness concerning the particular industrial sector of industry. Considering the nature of cost-leadership advantages, it becomes therefore reasonable to assume that the district acquired them especially through a fragmentation and a consequent fierce horizontal competition between horizontal economic actors. As documented, firms often overstepped legal allowances, given the huge amount of lump -and therefore untaxed- labour, however they also significantly deteriorated the possibilities for more comprising collective actions due to the bittering of their relations. Above all, this period would be almost entirely classifiable as a second exploitation phase if it was not for the changes happening in the first years of the eighties decade, when first decreases in demand also caused a sort of inversion in district's demographic trends. Some firms grow disproportionately in respect of others in order to achieve a more integrated and automated type of production, better adapted to the future kinds of market. Consequently to these facts, and in order to maintain high the added value of goods, district's firms increasingly focussed on new strategies oriented to *product upgrading* and *differentiation*, with the effect, however, that they had to specialise further in their particular activity. All in all, this short but intense period of cluster evolution presents, in addition to high levels turbulence in the aggregate, mixed features from both *growth* and *maturation* respectively more dominant in the beginning and in the end of the stage. In this sense a technological and strategic maturation of the system is achieved without any visible sustainment or stabilisation.

The final stage detected goes approximately from 1988 to 2000, and is the period that temporally precedes the crisis of Castel Goffredo's economic system. As understood, district's firms continue their path of development under the pressures of *global competition* and internationalisation, continuing de facto the process of verticalisation. In the new scenario of the nineties, external networks tend to become more relevant for the success of firms:

firstly, in order to take advantage of new markets recently opened, such as Eastern Europe and post-socialist countries; secondly, to contrast the increasingly lower trends of demand in the semi-saturated markets of developed countries. Moreover, in the same period, new competitors start in their turn to enter the sector of industrial textiles worldwide. Although, from reports and interviews it is understood that Castel Goffredo as a system is not, initially, particularly bothered by the global challenge (in fact the district undoubtedly possessed, in its industrial sector, a clear supremacy both in terms of technology and expertise in respect to its competitors) the process of verticalization and specialization becomes more visible. In effect, when considering the aspects of firm population, it might be observed that, although entries and exits find themselves in a sort of "quasi-sustainment", there is a slight inclination toward decline that affects, almost equally, stocking industries as well as subcontractors (especially in last years considered). Both historical reports and interviews confirm that relocations of industrial activities is in this period are present, but rare, and concern especially labour intensive phases of productions, not based on high expertise. Improvements in communication technology permitted to the actors able to take advantage of them - also those of modest size- to improve their visibility and to get in contact with a wider number of costumers external to the district itself. Going on, especially in the years right before 2000, the decreasing demand of hosieries pushes some districts' firms to find also other strategies, more radical than a mere upgrade in quality. This results in a modest *diversification* in other textile branches also continuing in the following years, based on seamless products and underwear. However, it is hinted that only a limited number of enterprises are effectively able to diversify their products and offer, thus, this evolutionary factor remains a secondary one throughout the period. Lastly, interview analysis reveals that, in the nineties, the distrusts and incomprehension between actors sharpen again and the negative sentiments typical of a situation of difficulty and decline start to emerge more clearly between cluster's parties. In sum, also the evolution of this period delineates a situation that hardly fits with only one of the "canonical" stages of clusters' life-cycle. On the one hand trends in employment and entrepreneurial activity (turbulence) reminds to a stage of *sustainment*. On the other hand, other features like the proceeding toward mono-structures, decrease in the number of firms, and the increase of negative sentiments in local actors, are instead associable with a phase of *decline*.

District's historical dimensions in time

After having examined the walk through stages undertaken by the district, it is possible to make assumptions about the trends followed by the different dimensions of change accompanying its evolution.

To start with, it is possible to state that the *heterogeneity* of the district as a system follows a path almost in line with what is considered, in cycle's studies, "a normal trend". In this sense, it appears clear that, during the period of emergence, the levels of heterogeneity concerning textile activities in the area was high (NOEMI itself was not solely a stocking firm) and the knowledge related to the sector is differentiated and dowry of a limited number of people. It follows that first entrepreneurs who were starting their activity with circular machines, had to cope with both the anxiety and uncertainty of a new innovation. In line with stylized facts on clusters' heterogeneity, the following stages of evolution generally see a sharp narrowing of the industrial thematic boundary, along with the technology, competences and the knowledge related to the latter (thus, the actual birth of the hosiery's district). In this sense, the division of the production chain in various units of subcontractors is hardly interpretable as a real regeneration of system's heterogeneity, since, rather than introducing new knowledge or routines, it tend to lead the cluster to specialize even more in deep. As observed, in fact, the competitive advantage of the district is built on a constant incremental innovation in the years, aimed to refine the current system of production, rather than with progressive shifts of economic actors in different activities or industrial sectors. The different commercial strategies adopted and diversification (such as seamless) are alleged to have renewed only slightly the heterogeneity among firms, however, this was more a temporary "thrust back", not able to change radically the nature of the industry: first because, as explained, this changes are not undertaken by the district in its whole, but by a minority of enterprises; secondly, since it might be argued that the knowledge and expertise needed for this shift do not come endogenously from the district, but (again) from the neighbouring mechanical cluster of Brescia - which effectively patented and sold the new machineries. Since single firms continue to remain the unique depositaries of knowledge and incubators of future entrepreneurs, the district started to suffer more blatantly from the absence of educational and research structures. More precisely, although the "learning by-doing" process had furnished local entrepreneurs with an effective all-comprising experience concerning their business sector, this was not sufficient for the creation of a more vast and diversified knowledge platform, eventually permitting the spacing of the cluster in other industrial themes. In other words, it is alleged that: well before reaching a situation of crisis, district's heterogeneitywas already impoverished, and firms were ended-up in a sort functional/cognitive lock-in,

hindering their absorbing capacity and attitudes toward cooperation (due to the similarity of business between the latters) and diversification.

If considering, instead, the dimensions of *networks* and *connectivity* the path followed by the district seems to differ considerably from stylized facts. In a way, it might be argued that the degree to which firms and organisations are "formally" connected is higher in first stages, rather than in later ones, especially for what concerns the relationship between the local industry and its regional environment. During emergence and growing phases the essentially local nature of the district contributes to maintain a certain "overlap" between first firms instituted and collective actors of socio-economic and institutional nature. Fruitful examples of this relation are: the birth of NOEMI heavily backed by local institutions (and the personality of Delfino Eoli); the help of the local bank to first pioneering firms; and the tax-break offered by local institutions, which facilitated the expansion of the district. However, the analysis of data gathered, evidences that the network between firms have hardly crossed the level of commercial relations throughout the development of the district. This probably because, especially at the horizontal level, firms were decisively unwilling to collaborate with actors of similar who could potentially steal from them valuable information. Moreover, in later stages, it is shown how deteriorated come to be also the relations with the very same institutional and organisational actors previously helping the development of the district itself (this difficulty is well represented by the scarce contacts and frictions between entrepreneurs, institutions and the local R&D: the Centro Servizi Calza). Hence, at least in terms of networks, it could be hinted that the district never reaches high levels of active interaction between its component actors. In this sense, a true rigor in terms of connectivity or verticalisation is not reached and relations within the economic system remain rather distant and loose (so much so that, still nowadays, the district is far from a mono-structure). As understood, this fragmentary nature is a constant peculiarity of the district, which becomes evident especially during periods of expansion. On the one hand, it seems a fact that such assets enhanced the competitiveness of firms during early development stages, in a situation generally characterized by higher demand of products. On the other hand, this non-connectivity, embittered by distrusting negative sentiments, became an obstacle in later stages, when joint actions or plans were required in order to ward-off the future situation-ditching. All in all considered, however, this sort of socio-economic weak lock-in, could not prevent the effective *embeddedness* (intended has a broader set of interdependencies between firms, employment, the industrial theme and the regional environment) from rising further, increasing, de facto, the rigidity of the system. Hence, it might be stated that while connectivity between actors tends to remain low during cluster's stages, overall

connectedness of the system tends, instead, to rise reaching high levels before districts' decline.

In last instance, a theoretical concept analysed, in relation to the case study, is the one of *resilience* of the system. That is, the capacity of the complex system to resist, react and recover from endogenous and exogenous shocks of various nature, which notably depends from many exogenous and endogenous factors. The entry of NOEMI represents the starting point of a reorganisation's phase in respect of the previous production system, in which the resilience of the embryonic district (represented by the foundation of the first firm) slightly increases and remains steady for a long amount of time, until a phase of exploitation. After the birth of first industries and their consequent proliferation, it might be hinted that, for at least twenty years, the system grows sharply in terms of resilience, given the extremely high demand of the very same products, in which firms were specializing. However, the periodical crises happening frequently also during the period of cluster's heyday suggest a generally "fragile" nature of the industrial sector (susceptible to several external shocks and circumstances) with an overall low *resistance* of the system. Consequently, after having undertaken maturation – and notwithstanding the general improvements of commercial and entrepreneurial strategies- the path based on specialisation and incremental innovation, accompanied by patterns of lowering demand, determined the first slight decrease in resilience. Important is to note, however, that the district was not really perceived by actors for being in a potential phase of decline, in effect, despite verticalisations and some inverted trends in firms' population, turnovers were clearly positive and levels of employment increasing. As such, the true decrease of systems' resilience occurs probably only in later stages of the cluster, when, in face of new and advanced economic regimes, the district was not able to renew and change its profound nature, this especially due to the narrowing of views and impossibility to cooperate between its actors.

Thus, all in all considered, at least in the present case study the trends followed by the various dimensions of change do not seem to mirror straightforwardly those described by the conceptual literature. While it appears to be true that each stage of development (and cycle) presents varying and specific levels of each one of the changing dimension, these latters seem to follow a path largely depending from the contextual situation and the strategies adopted by the system. In *Figure 4* we attempt a visual representation of the evolving changing dimensions of Castel goffredo's evolutionary cycle.

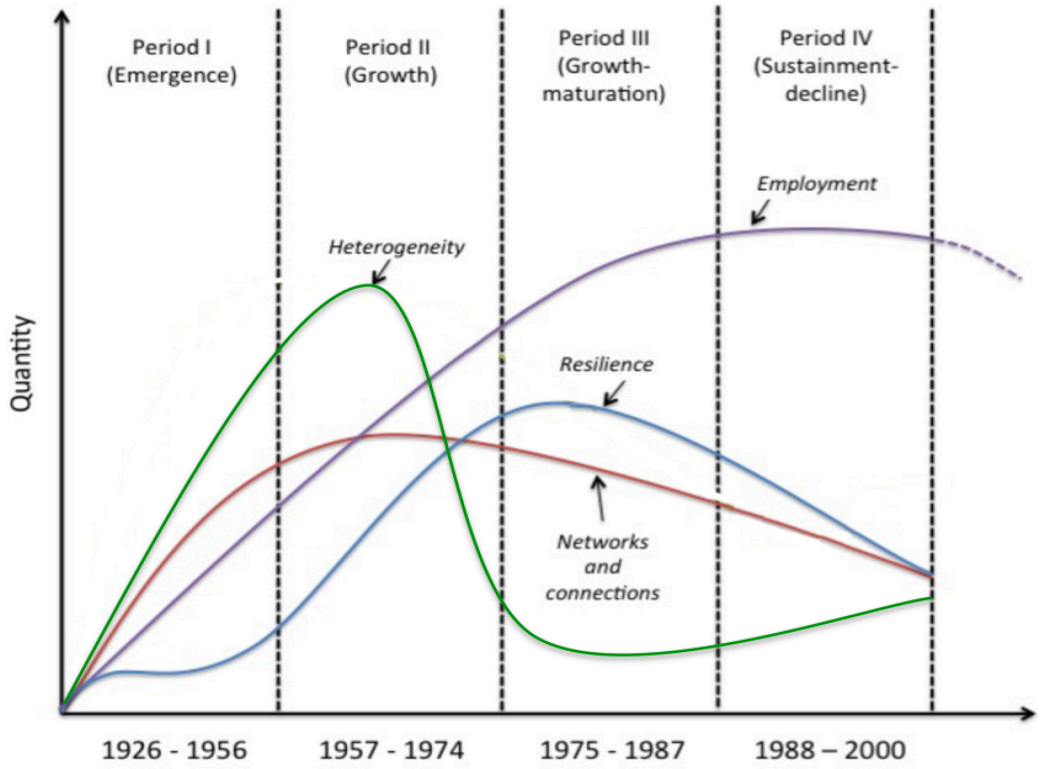


Figure 4: Interpretation of the various trends of the dimensions of change considering the analysis of Castel Goffredo's evolutionary cycle.

Importance of socio-cultural and institutional context

In last instance, after having dealt with economic evolution, stages and historical concepts related to the district's life-cycle, some words might also be spent on the place-dependent social macrostructures and values, which are also seen evolving with the economic system in question. Notably, it is observable how relations of power, influenced by geographically specific cultural, ideological and institutional factors had, in effect, a crucial role in influencing the trajectory taken by the cluster. As argued by several experts, who made research on the district, the characters of diffused self-entrepreneurship and orientation toward family business were present on the territory since immemorial time, this along with a parcelling and fragmentation of rural land titles and credit/financial power. It is hinted that such assets and orientations reflected a perspective toward life and fulfilment strongly influenced by a rural culture and Christian values. Along with the promotion of a strong ethic of sacrifice for the familiar wellbeing, this cultural pattern holds in high regard achievements of individuals and displays lesser inclination to put faith into strong top-down governmental regulations. Following this, in the first decades of the twentieth century, agriculture in the

area was relatively prosperous and, although the town was prominently rural, poverty was not a particularly blatant problem of Castel Goffredo. However, emigration toward industrial cities was high, since such fragmented social assets hindered for a long time any concrete effort aimed to undertake a radical renewal of the productive system. Thus, the introduction of a radical innovation and, in turn, the birth of a new industry on the territory was possible only during the fascist period: when Delfino Eoli, thanks to the power obtained, was able to convey, financial credits and institutional consensus, necessary for NOEMI's establishment. After the fall of totalitarianisms, and the decline of the mother-firm, it is observed how -thanks to the diffusion of first circular machines- the socio economic structure of the area tended to return substantially similar to the one of the previous centuries, with the emergence of a multitude of small firms on the territory. First stocking industries were, in effect, mainly family-based or reliant on strong social relations and commitment between entrepreneurs and workers. Thus, it is alleged that the rediscovering of such socio-economic dimension associated with the geographical area, besides clearly explaining the processes of imitation of "the best behaviours", had also an important role for district's birth and system's self-regulation. Reputation and trust between economic actors had in effect an important role in the selection of firms, preventing opportunisms and counter-productive attitudes. However, it might also be argued that, especially in the long term, these very same socio-cultural factors might have had a stake in letting emerge the vicious spiral of cut-throat competition and non-cooperation between parties, detrimental in later stages of district's development. More generally, it might be speculated that the hard-working and production oriented "rural mentality" of the district, somewhat heightened the myopic behaviour of entrepreneurs, who, despite the well-argued (and experienced) precariousness of the sector, were not able to foresee the serious future incoming problems. In a way, it might possible to state that the entrepreneurial culture itself hindered in some regards the far-sightedness and compatibility of firms. In addition, notwithstanding the important role previously covered for cluster's growth and expansion, in the long run also institutions tend to become detached from the reality of the district and incapable of entering in a deeper dialogue with entrepreneurial actors. Much difficulties are, in fact, encountered among the parties which seems to differ largely for what concerns their organisational assets, approaches to problems and solutions and, nonetheless, political orientations. In sum, what could be stated is that the district of Castel Goffredo evolved -or co-evolved- mostly "anarchically", in relation with a social, cultural and economic substrate of norms and values, which was already present on the territory from long time before its birth and which considerably conditioned its historical development and economic assets.

6. Discussion and Conclusion

6.1 Introduction and aim of research

Theories and frameworks dealing with the evolutionary cycle of clusters are appealing concepts, yet in need of additional research, both due to their novelty and complexity. The research forming the subject of this report was carried out on the Italian industrial district of Castel Goffredo , which, starting from about a dozen year before present,has seen a gradual decline in its assets. The main objectives of the present dissertation were: firstlyto enrich the current EEG's literature about clusters' evolutionary cycle, by examining in-depth the particular life-cycle of our case-study; secondly, to prove the validity of conceptual frameworks of cluster cycle as tools for historical analysis of clusters. In particular, we focussed our attention on the relation between the evolutionary cycle and its varying dimensions of change . In this sense, our work was oriented to answer two focal research questions in their turn respectively divided into four and two sub-questions.

Chapter 1 of this report was constituted by a brief introduction, the outlining of main questions of research and structure of the report. Chapters 2 and 3 were devoted to the literature review and theoretical foundations from which we draw the main insights for our research. While in the former we have warranted about the need of more historical perspectives,in the ensuing we have introduced the various concepts of evolutionary cycle, configured in the wider paradigm of Evolutionary Economic Geography. In chapter 4 we presented the industrial district of Castel Goffredo, which served as case study for our research, and outlined the strategy and methodology used. Continuing, chapter 5 was the core of our report and the part of empirical findings and, for this reasons, it became divided into four sessions in their turn into two specular sections (one dealing with the periods of development detected and the other with their analysis), results were therefore summarized and discussed in a subsession apart (5.5) . Finally in the present chapter 6, we will answer initial research questions, discuss limitations of our enquiry an conclude by outlining the horizons for further research.

6.2 Questions and answers

1) What kind of evolutionary cycle for Castel Goffredo?

This first question of research had mainly theoretical and academic purposes, but also more practical implications. Our purpose was to perform an historical analysis on the district of Castel Goffredo, using it has a valuable case study for the literature on the topic. Precisely, we wanted to test how the idea of cluster's cycle could fit with the development of Castel Goffredo. Thus, we identified and analysed what were the periods of cluster evolution and considered how they fitted with stylized facts and models previously discussed. As such, in addition to examine and discuss the division in life stages, it was given a full dynamic perspective of the whole historical evolution of the district, from its birth to the beginning of its recent crisis (after 2000). We answer and discuss the present question following the guide of four different sub-questions.

a) Which periods are identifiable and correspondent to which stages of development?

The analysis of historical reports, firms population and grounded theory, as well as the consequent identification of triggering factors, periods of turbulence, location of start-ups and cluster's rationales, have evidenced four periods, corresponding to different cycle stages (or phases) of district's development.

Firstly, it was recognized a long emergence phase, in which the first firm (NOEMI) was established, thanks to an idiosyncratic process, and the establishment of knowledge pipeline a new innovation and industry was brought on the territory. In this instance it is clear that - in line with what stated by Fornahl et al (2010) in their study on clusters' emergence -, the triggering factor giving the bases for cluster's birth is better identifiable in an idiosyncratic process rather than a single event. Undoubtly prominent was a component of causality and chance events (Storper and Walker, 1989; Krugman, 1991), and hence the episodes which saw the exile of Delfino Eoli. These in fact ultimately resulted in an unplanned "knowledge buzz" (Bathelt et al., 2004) which made possible the thinking about of a new industry in the area of Castel Goffredo. However, it is understood that other factors were crucial for the triggering action. Previous assets and resources of Castel Goffredo's economic landscape constituted, in effect, a favourable environment. In this sense regional path-dependent factors were of particular importance (Martin and Sunley, 2006; Martin, 2010), since the region was probably, if not advantaged, at least idoneous for the hosting of this new kind of industry – this for availability of primary resources and labour force. In addition, determinant was also the roles played by institutional and strategic action (Henn and Laureys, 2010) (chiefly impersonated by the same Delfino Eoli), through which was possible to create necessary

consensus, and attract material and non-material resources from other regions (Boschma, 2007). The first anchor firm was in effect established with the help of a trans-local pipeline (Bathelt et al., 2004, Bathelt and Gluckler, 2011), which saw the collaboration of two geographical realities, unified especially by a political bond. In last instance, it is interesting to note that the rise of first firms happens in concomitance with a crisis of the anchor firm, which generates negative sentiments and disagreements (Klepper, 2007; Dahl et al., 2010) among members, propelling in turn the departure of first pioneers.

Secondly, it was identified a period of growth and seizing of opportunities, which saw an increase in the number of firms and the birth of the proper hosiery district in the area of Castel Goffredo a period well representing a growth/exploitation phase. Thus, following an EEG's perspective and insights, we went deep in analysing the motivations which brought Castel Goffredo to develop in a plurality firms –instead the form of a mono-structure -. Even in this case it has been observed how this phenomenon was ascribable to various causes. The factor permitting micro-entrepreneurship is to be found primary in the particular technological innovation represented by the introduction of circular machines, which in addition to cost less, could be handled individually and necessitated less space. This advancement was possible thanks to the presence and the competences of nearby mechanical cluster of Brescia, where engineers and technicians were somehow able to study previous machineries of Noemi. In this sense, for the emerging industry it is clear the importance on the territory of an already diffused analytical and generic knowledge, able to intercept the innovation, and progressively co-evolve and become more specific in regard of a determined sector of industry (Boschma, 2007; Asheim et al., 2011). Other factors which notably contributed to the fragmented nature of district's growth, were the diffused knowledge in the industrial field and presence of skilled human capital (Otto and Fornahl, 2010) – both developed during the years of NOEMI's activity -, associated with the availability of family-partitioned financial capital for the purchase of machineries, deriving from previous activities (Avnimelech and Teubald, 2010). Finally, not less important, was also the type of locally bounded and persistent entrepreneurial culture (Stam, 2010; Fritsch and Wyrwich, 2012) present in the area, based on a strong individual morality and oriented to the values of Christianity and self-realisation, privileging, therefore, small family businesses. Thus, all the above discussed factors are supposed to have played a crucial role in conditioning the effective rise of a cluster. As understood, during the growth phase the district was already able to condition its broader local environment, but the heterogeneity of its technological thematic boundary had decreased dramatically from early years (Menzel and Fornhal, 2009) being productions and competences completely centered on circular machines. Furthermore, some of the problems

linked to the peripheral nature of the economic system (see Todtling and Trippl, 2005) were already perceivable during these years.

Thirdly, a particularly turbulent phase when the clusters grows further and expands, thanks to the entry of many subcontractors, but in which also a maturation occurs, and the cluster strongly specialises on a rather narrow trajectory: a period of growth/maturation. In this sense, the district continues to develop following a trend still typical of a period of growth, with high entries, shakeouts and, thus entrepreneurial activity (Kohler and Otto, 2008; Menzel and Fornhal, 2009). Moreover, even though it is clear that the district as acquired sufficient importance to influence regional processes (Menzel and Fornhal, 2009) there is no real evidence of rigidifying of the relationships between firms, or thickening of institutions, typical of clusters' more advanced stages (Hassink, 2010a; Ter Wal and Boschma, 2009; Menzel and Fornhal, 2009). However, great changes at the system's level occurred anyway. In fact, after having fully exploited the potential of the new innovation and having built its richness in a moment of extremely high demand, the district entered a phase characterized by verticalisation and specialisation. The seasoned sector of textile-hosieries led entrepreneurs to undertake strategies of cost leadership, machineries' upgrade, product amelioration and, therefore, incremental innovation, in order to remain competitive. This path, however, predictably brought the district to a full maturation of a certain industrial trajectory (Toddling and Trippl, 2005; Trippl and Otto, 2009; Hassink, 2010). Related to this, another sign of maturation is represented by the fact that district firms start to take advantage more directly from external networks for the selling of their goods, this in order to avoid problems linked to saturation and exploit new possibilities (Ter Wal and Boschma, 2009).

Fourthly, it was recognized another period bearing intermediate characteristics, which, despite the apparent quietness and high levels of capital accumulation, disguised problems related to the endogenous assets of district and its safety in relation to future challenges: thus, a period we a have labelled as a sustainment/decline. In this last stage analysed, in line with a conservation phase, after having experienced a significant shakeout, entrepreneurial activity and turbulence decreased in the district and levels of employment reached their highest peaks (Kohler and Otto, 2008; Menzel and Fornhal, 2009). However, it might be observed a general trend of decrease in the number of organisations and the appearance of many negative sentiments symptom of an imminent (or already began) decline (Menzel and Fornhal, 2009). Despite differentiations and, to some extent, diversifications, no radical technologies were introduced and the industrial trajectory became exhausted (Utterback, 1994; Hassink, 2010a). Consequently, especially larger enterprises started to warmly back the idea of undertaking labour-intensive phases abroad, therefore, relocating part of their production in cheaper countries.

b) Are the phases of the cycle neatly distinguishable?

In the light of this research it appears particularly difficult to divide neatly the development of the district in separated stylized stages of a life or adaptive cycle, especially for what concerns most advanced moments of cluster development. In effect, except the long - but at the same time well defined - emergence stage, other periods are hardly classifiable as unique. Apart, in fact, from the effective blurring of different subsequent stages (in the sense that it appears difficult to state precisely whether a stage begins or finishes, taking respectively into consideration the antecedent and following period), what seems to be the case is that also periods at relatively early stage might exhibit some characteristics or features typical instead of a later stage, or vice versa. For example, if on the one side the stage of growth already hides features of decline, represented by periodical crises and unwillingness for any renewal in the industrial theme, on the other side, the last period analysed still presents growing trends of capital, employment and few diversifications. The division in stages might therefore be better appreciated especially when considering concrete elements like: the evolutionary factors, or - even though to a lesser extent - the trends of historical firm population. Evolutionary/ triggering factors (Martin and Sunley, 2006; Bellussi and Sedita, 2009, Elola et al., 2012) being endogenous or exogenous, are also seen varying, more or less clearly, from a period to another, and are identifiable as the main drivers of peculiar district development, strategies chosen and path created. Although also the importance of an evolutionary factor might space in more than one stage (for example, it could be argued that the influence of cost leadership was already strong during the first period of growth of the cluster and continued also in the decades to follow), in this case study it was observed that each period was prominently conditioned by at best two peculiar triggering factors for each stage. In second instance, also the study of firms' population gave valuable insights in the interpretation of cluster's cycle. Following the insights of previous researches (as Heebels and Boschma, 2011), through the study of turbulence rates, it was possible to give a more precise demarcation for what concerns the temporal dimension and span of various stages. Each phase, in effect, seems to exhibit peculiar trends concerning the frequency of entries and exits of firms, without reflecting however the assumptions of stylized conceptual literature.

c) Is it possible to recognize any real phase or sign of equilibrium?

The analysis of the firm population, the degree of entrepreneurial activity and the relational assets of the district are among the findings that more clearly deny the presence of equilibrium during the historical development of the district. First of all, what is clear is that he district passes fairly abruptly from a long period of demographic rise in the number of

organisations to another of morphological decrease. Only if considering the population of Calzifici, it might be observed that the general trend of development resembles more the stylized bell-shaped curve, which generally characterizes the trend of cluster's population in time (Menzel and Fornhal, 2009). However, what remains evident, is essentially the absence of a prolonged period of stabilisation or contained oscillation in the total number of firms, regardless the group of firms taken into account. In fact, also during periods of heyday, the cluster is always threatened by numerous crises, and its growth does not take place steadily, but with an incessant process of shakeouts and recovers. The "second growth" of subcontractors and the consequent focus on specialisation with technological upgrades, indicate that, even in later stages, the situation of the district is hardly interpretable as a stasis, especially if considering the micro-level of firms and circulation of ideas (Staber, 2010). Moreover, it has been observed, how the cluster basically tends to maintain a fragmented and disconnected relations between actors and parties also during advanced stages of development. Thus, at least on a theoretical level, this findings are slightly in contrast with 'normal' conceptions of life cycle, which tend to identify the presence of a period of rest after the growth, in which the number of firms entered matches the one of the exits, entrepreneurial activity is lower and the relations between economic and institutional actors tend essentially to reinforce and crystallize (Menzel and Fornhal, 2009; Ter Wal and Boschma, 2007). In a nutshell, even though it is undeniable the fact that the district is seen proceeding from an embryonic stage to another of almost decay –by walking through different periods-, facts about systems evolution evidence that this passage happens in the shape of a complex, dynamic and ever-shifting process rather than a situation of linear stasis or punctuated equilibriums from a status to another (Martin, 2010; Martin and Sunley, 2010). Precisely, an in-depth analysis, in addition to the observed and well-known external shocks hitting the district, shows also what continues to happen endogenously at the internal and micro-level.

d) Life or adaptive cycle?

By analysing Castel Goffredo's life cycle, is also possible to make some considerations about which models of cluster's cycle could better describe the development of the historical district. The fact that the district tends to follow a path similar to the one of a "classic life-cycle" should not probably be jettisoned altogether. In effect, it might also be argued that the district passes, although not clearly, from all the different stylized stages of a cluster's life-cycle (see Kohler and Otto, 2008; Menzel and Fornhal, 2009; Ter Wal and Boschma, 2009). In effects, the district proceeds by describing a sort of "bell-shaped" curve, bringing its system from birth to a sort of decline, with its period of heyday coinciding with the maturing

phase. Moreover, the dynamics which brought to the emergence and growth of the district are thoroughly explainable with concept that derive from a basic life cycle approach - thus: the establishment of a new firm on the territory through a knowledge pipeline, disagreement/spinoffs, imitation processes and growth in the total number of organisations. Following this, it is also possible to speculate that the analysed period of cluster's development – thus, 2nd, 3rd, 4th stages of cluster development, including recent developments, but excluding emergence stage– is essentially divisible in two macro-phases, strongly linked to the life-cycle of the product. A first one of growth and exploitation, in which the cluster more or less continuously increases in size and population of firms, and a second one of stagnation, in which the district progressively "scrapes a living" through verticalizations, specialisations and reductions in size (still going on nowadays).

From another perspective, however, due to their characteristics and outcomes, the sequences forming district's path are hardly classifiable as stylized stages of a life-cycle model, especially when reflecting on both their quantitative/qualitative dimensions and rationales. Considering firms' demographic trends, the cluster does not reflect the insights of conceptual literature. Turbulence appears higher in the maturing phase rather than in the growing and the system is never seen entering in a proper *sustainment* stage, since it almost suddenly passes from a phase of growth to another of (negative) semi-conservation. Accordingly, the reaches the maximum geographical expansion during its maturation, since activities tent to re-concentrate afterward and heterogeneity of knowledge seems to drop significantly already from initial stages, due to the characteristics of the industry and the product, but, due to differentiations and diversifications it tends to increase slightly in later stages. Lastly, the involvement and influence of institutions seem to be more observable in earlier stages rather than after maturation and, related to this, some ever-present features of the system such as disconnectedness, fragmentation and "organisational thinness" tend to transcend the different evolutionary stages being, instead, cross-cutting features constantly accompanying the cluster cycle throughout its unfolding (they are already present in the phase of growth/exploitation). Finally, it could be observed that at least two out of four of the periods examined (thus, growth/maturation and stabilization/decline) tend to exhibit a sort of "hybrid identity", which straddles the line between different stylized stages. Hence, rather than a series of punctuated and independent stages of equilibrium, the entire evolution of the district should probably be better conceived in its whole as an historical process and as a complex, dynamic and continuative series of both fortunate and path-dependent events, which ultimately brought to a decrease of resilience and district's recent situation (Martin, 2010).For the listed reasons, a

description based on an adaptive-cycle meta-model probably appears as more suitable and fitting for what concerns the description of present case, since it allows for more flexibility in the analysis and interpretation of the peculiar district's trajectory. In particular, the cluster is still seen surviving, though in a reduced form (due to verticalisations), by constantly upgrading its functions by means of incremental innovation, detaining a decisively modest degree of resilience and a precarious inclination toward decline in the process –similar to the stylized "stabilization trajectory" described by Martin and Sunley, (2011, p. 1313-1314).

2) How could an historical and cycle-oriented analysis give additional insights on the motivations causing the decline of the district?

This second question was instead much more focussed on the case study and its specific problems. In this regard it referred to more practical implications for this research. At the same time, it had also a theoretical aim, since it had to show, in general, the leverage potentially furnished by an in-depth and dynamic analysis on clusters. Given the abrupt decline of the cluster, starting from 2000, we attempted to give explanations based on our perspectives of research. More precisely, we wanted to give additional explanations about the factors which caused districts' crisis, considering the latter not only as the mere result of sudden exogenous shocks or contingent situation, but rather as an historical process unfolding during the development of the system. Thus, we gave an interpretation based on the analysis of cluster's cycle, with an eye to the so-called "dimensions of change": heterogeneity, connectedness and resilience, varying during the cycle of the cluster. In second instance, an in-depth historical analysis helped to shed light on possible lock-ins affecting the cluster and to make suggestions about their origin.

a) Is there a "decline before decline" considering various dimensions of change? How they evolve?

This research argues that, already before the decline –which, threw the district in a spiral of constantly decreasing levels of employment and increasing levels of verticalization-, the system in question was already suffering from problems prominently deriving from its endogenous assets, which lowered decisively its fitness. Precisely, an answer is given by considering the varying dimensions of change of the industrial cluster, each one presenting particular characteristics in relation to cluster's development.

For what concerns the heterogeneity of the system it is clear how the district substantially arrives to an exhausted trajectory in its industrial field. As such, the cluster remained essentially monothematic after the choice of circular machines and hosieries' production as main drivers of business and development. Thus, during the cycle of the cluster, no significant innovation were introduced able to significantly differentiate or renew its economic landscape (Menzel and Fornhal, 2009), and the strategy adopted generally by economic actors and organisations resulted in a continuous incremental change. Instead, only a small number of firmseffectively dived in a diversification processes (happening only partially in later stages) and no signs of what could be considered a real radical change subsisted (Trippl and Otto, 2008). It is also understood that the lack of variety might be related to the underestimation of the role of education in the area and to the absence of proper structures apt to promote developed levels of schooling and research. Since firms themselves became, in time, the effective places for the formation of new entrepreneurs, by following a differentiated knowledge base perspective (Asheim and Gertler, 2005; Asheim et al., 2011) it might be argued that: while the district manages to develop, in time, the synthetic and symbolic knowledge linked to its industrial sector, same cannot be stated for analytical knowledge, which could have become crucial for a deeper renewal or re-orientation of the district itself. It is hinted thatthe focussing and narrowing of activities increased the "monochrome" of the district that over-specialized, and was rendered more vulnerable to the crises affecting its specific sector. Moreover, findings seem to suggest that, whilst the close functional similarities between firms might have enhanced competition, they might also have discouraged contacts between firms and their willing to cooperate with each other. As such, the cluster might have struggled about finding optimal levels of proximity in the long term (Boschma and Frenken, 2010).

When considering relations and interconnectedness of the system it might be argued that the cluster, even in later stages, maintainsin many regards its structure of peripheral textile industrial district - which still largely characterizes its frame nowadays (Capasso et al., 2012) -, thus: a cluster which firms are slightly verticalized, but far from a mono-structure; based on flexible relations between firms and on subcontracting; and prominently family-business oriented, without a strong mingling between entrepreneurial and institutional parties operating on the territory. Relations between actors remained prominently commercial, during the development of the district, and based on the often-changing relationships between larger producers and subcontractors. As such, it would appear to affirm that the district never undertook any sort of strong network lock-in (Ter Wal and Boschma, 2009). However, it has been observed how: this fragmentation and deregulation, while crucial for cluster's early success, became further evident generators of negative sentiments and un-coordination. Both

firms and institutions did not succeed in creating networks or arrangements effectively able to benefit the situation of the district. In this regard, from a regional perspective, the cluster in question clearly belongs to those peripheral regions characterized by "organisational thinness", in which connections of the economic system are rather weakly developed and in which "technology transfer organisations have been set up in a past in order to improve the situation, but they are (frequently) not effective" (Todling and Trippl, 2005 p. 1210). Besides, the discourse around relations and connections appears to be more complicated than expected. In fact, while it is true that the cluster maintained an evident fragmentation during the decades, the overall set of indirect interdependencies between the industrial sector and the local economic landscape became, in any case, very intense (considering the similarity between firms, the crystallizing of competences and total number of employed gravitating around the hosiery industry). Thus, in line with what stated by Simmie and Martin (2010) and Martin and Sunley (2011), it seems that a trade-off between connectedness and adaptability of the system might be effectively occurring.

Lastly, it was attempted and interpretation of systems resilience and adaptability. It must be stated that given the essentially complex and panarchist nature of the notion, an analysis of this concept, in the ambit of the case study, was possible especially by considering historical events associated with the variations of the other two dimensions and cluster stages. Following this, it might be understood that the district never reached particularly high levels of resilience. However, it might be hinted that the authentic "drop" happened in the last period taken into account: when a situation of low heterogeneity and variety in the economic landscape crossed with another of fragmentation and distrust between economic actors - all in a context of global competition and general decrease of hosieries' demand -. In this sense, also this case study evidences the composite nature of such dimension, along with its linkage with other evolving patterns of cluster's cycle (like heterogeneity, adaptability, connectivity and embeddedness). In first instance, it must be noted that the type of decrease in system's resilience will not bring to a disappearance of the district but, rather, to a progressive reduction in scale toward industrial macro-structure, beginning of "chronic slow-burn" (Pendall et al., 2009; Martin and Sunley, 2011). Moreover, the fact that the negative impacts of the decline affect especially employment and labour market (sparing instead the turnover, which still remains positive) suggests that the cluster manages to retain a certain degree of resiliency in certain respects but not in others (in line with the insights of Martin, 2012).

Thus, in conclusion, while it is possible to state that the decline of the hosiery district of Castel Goffredo started to be visible after 2000, it began, *historically,* when the system's dimensions of change: heterogeneity, connectivity, connectedness and, most of all, resilience, were already became not favourable. From our analysis it is also hinted that the trend of the

various dimensions of change is not strictly determined by the life stages in which the cluster rests. In this sense, although it is figured that the changing dimensions are clearly influenced by the cluster's ageing process and that they tend to have an impact on each other, it might be argued that their trend is rather "irregular" and dissimilar from the one described by stylized facts. Changing dimensions appear more as complex concepts themselves, which are anytime conditioned by a multitude of factors (such as events, strategies or situations), rather than entities merely depending from the contingent cluster's stage.

b) Is the decline eventually caused by lock-in dynamics?

To begin with, it might be observed that the district was affected by a functional lock-in from relatively early stages. The area specialized in the production of hosieries and, notwithstanding the periodic crises striking the industrial sector, production remained focussed on a narrow trajectory, without a rise of differentiated or more flexible activities. Competences specialized with an emphasis on low to medium levels of qualification - ranging from technical to managerial skills - inherent to the activity undertaken, which were often learnt-by-doing. Consequently, especially in the years in which the district officially became hegemonic in its industrial sector (and when high amounts of capital were already available), myopic perspectives were strengthened, which hindered the capacity of economic actors to think about valid alternatives in case of difficulty of the present assets. Thus, also a cognitive lock-in on a large scale occurred. Considering the period analysed, it might be argued that the only lock-in avoided was the political-one, since relations with institutions and processes of knowledge transfer remained "low rather than thick profile" (see Todtling and Trippl, 2005; Hassink, 2007; Cho and Hassink, 2009). In sum, notwithstanding the political and institutional weak lock-ins, typical of the clusters of its kind, the district remained staked in a narrow trajectory all the same. This happened in the way of peripheral regions which "main problems are low levels of R&D and innovation due to a dominance of SMEs in traditional industries, weakly developed firm clusters, few knowledge providers and weak endowment with innovation support institutions" (Todtling and Trippl, 2005, p. 1215).

We are of the advice that one of the main causes of such particular rigidifying is to be found chiefly in the particular evolutionary factor driving district's evolution. What emerges is in fact that: while, on the one hand the cluster, during its initial emerging and exploitation phases, was remarkably quick and efficient in seizing the new opportunities represented by an incoming innovation; on the other hand, building afterward its advantage on prices and specialisations proved not as the best strategy to remain resilient in the long run as a system.

Cost leadership helped the district to reach a leading position in its industry, but progressively forced firms to a progressive fierce competition on prices between each other (and further also with their global competitors) that became hardly sustainable especially in the future. Similarly, incremental innovations and product upgrades allowed only a limited number of actors to pass an harsh selection and enter de facto in the "world-class manufacture". Both the strategies implied conservation of existing structures and modernisations of productions, therefore resulting in a perpetual self-organised adjustment on a larger scale (Hassink, 2010a), which locked the industrial trajectory. Moreover, it is alleged that such evolutionary factor also worsened the relations between firms - especially at the horizontal level - and enforced individualism, since firms with very similar technologies were forced to compete on very narrow margins of profit. Thus in concomitance with the adoption of such strategies the district fell into a sort of negative spiral which ended up in a lock-in of both functional and cognitive nature accompanied by a decline in heterogeneity. It follows that: the stage in which the cluster reached its heyday, is also the one in which, allegedly, its resilience in face of shocks effectively started to decrease. In second instance, through a deeper analysis, it is possible to evidence that socio-economic and cultural place-dependent factors did not play a marginal role in the destiny of the district along with the role covered by institutions (Pike et al., 2010, Boschma and Capone, 2014). In fact, in relation to adaptability, the district appears to have in its whole problems linked with its socio-cultural-institutional capital and territorial structures of governance. It was described, in fact, how important was the persistence of a particular entrepreneurial culture based on rural values for the development pathway undertaken by the district. On the one hand, social assets - linked with financial power - became crucial for the rise of the cluster itself, since they enhanced a pattern of small entrepreneurship against those of mono-structures. Moreover, the strong ethic of sacrifice, apt to satisfy the needs and the values of the family, is also alleged to have boosted competition, and spurred entrepreneurs, workers and firms to do their best. On the other hand, it brought to a lack of unity and high fragmentation in the economic landscape of the cluster, which, in addition to hinder the capacity of firms to cooperate and lobby, probably contributed to the sense of mistrust which rendered considerably thorny the relations between enterprises and institutions. It might even be speculated (but not stated) that the very same "rural mentality" became an obstacle for innovation and the exploration of new possibilities, since regional innovations are de facto embedded (if not immerged) in the socio-economic and cultural setting (Todtling and Trippl, 2005). This finding somewhat relates to what was suggested by some scholars, who advised about the importance of social factors for the adaptability of clusters (Pike et al., 2010; Hassink, 2010).

6.3 Considerations on the research and some conclusions

Relevance of the research and main insights

Considering the overall results of the present work we could affirm that the type of enquiry conducted and the findings of our study have interesting implication for what concerns both more theoretical and practical aspects of research. First of all, for what concerns more theoretical and academic objectives, we were able to show that the interpretation of clusters' cycle might become troublesome if the stylized concept suggested by conceptual literature are employed in a straight manner. In fact, clusters tend to evolve out-of-equilibrium following not unambiguous trajectory, this along with the stages of development and dimensions of change which characterize their evolutionary cycles. In this regard, we have assessed that a conceptual framework able to combine the strength of different meta-models and notions coming from different cycle frameworks (in this regard life/adaptive and triggering factors), might have effectively a more comprehensive standpoint compared to traditional basic stylized models. Precisely, we have concluded that, rather than a series of punctuated and independent stages of equilibrium, the entire evolutionary cycle of the district should probably be better conceived in its whole as a complex, dynamic and continuative process (Martin, 2010), tending to connect rather than divide all the phases examined. In this regard the employing of concepts deriving respectively from either the approaches of life and adaptive cycle was crucial in order to better grasp such complexity. Thus, while a life-cycle analysis could fit especially with the review of first development stages (emergence and growth), the insights deriving from a more ecological and adaptive perspective were fundamental for a more exhaustive interpretation of those phases that exhibited, instead, a more ambiguous and mixed trajectory (maturity and conservation). Furthermore, the inclusion of the notion of triggering factor empowered considerably our framework for cluster cycle analysis, and this essentially for three main reasons: firstly, since each period of the evolutionary cycle bear mixed stylized characteristics, but peculiar triggering factors, their individuation helps in the process of distinguishing different stages of development; secondly, the study of triggering factors shed additional light on the motivations which cause the transition from one phase of development to another; thirdly, it was observed that the adoption of certain triggering factors conditioned the process of path-creation and long term trajectories undertaken by the cluster.

In second instance, we demonstrated that an in-depth examination of the cluster evolutionary cycle, based on a longitudinal and extensive use of data, had a remarkable leverage in terms of explanatory power and dynamicity when applied as a tool for the investigation on clusters. As understood, in fact, the current predicament of the district should not be interpreted only

as an output deriving from the current state of affairs but as the end of an historical course. Precisely, we have observed how, on the eve of its decline, the district already presented some features reminding to a weakened system in relations to its dimensions of change of heterogeneity, connectivity and resilience. Right before its decline, the district's system (taken as a regional economic landscape) was clearly unfit in respect to external shocks, since presenting itself as fragmented and peripheral industrial reality characterized, however, by an highly uniform industrial theme at the same time. It is additionally understood that to contribute to the building of such trajectories in time were especially the strategies collectively followed by district's firms and, chiefly, the choosing of cost leadership and incremental upgrade of products (differentiation) still during the period of cluster heyday. In this regard, our research basically supports the traditional EEG's statements that the same elements characterizing the advantage of a determinate economic landscape in the past might eventually turn into stubborn obstacles in a future (Malmberg and Maskell, 2010); and that diversification and variety of firms and activities within an economic landscape is preferable to the focussing on only one winning sector, to better avoid the effects of lock-ins (Frenken et al, 2007; Boschma and Frenken, 2011). Into the bargain, however, considered the subject studied and results obtained it also invites to revisit the assumption that tends to directly associate "weak lock-ins" with an increased regional adaptability (Hassink, 2007; 2010a). As proven, in fact, clusters of peripheral and fragmented nature could eventually become as prone to the turning into stone of their functional trajectories as old and mo-structural industrial areas, if not backed by a sufficient amount of R&D levels and institutions for innovation support (Todtling and Trippl, 2005).

Ultimately, after having analyzed the type of evolutionary cycle, we have also reflected on the importance of place-specific factors of higher-order in such process. As understood, in fact, the particular type of entrepreneurial culture; socio-economic and cultural norms; and political believes present in the area played an important role in shaping the development of district from growth to later stages. Since this factors are essentially linked to the historical geographical conditions of the territory they are also alleged to be persistent and path-dependent (Cho and Hassink, 2009; McKinnon et al., 2009; Pike et al., 2010; Hassink and Klaerding, 2012).

Limits of research and remarks

Before moving toward the definitive conclusion of this dissertation, and after having outlined what are the main findings and novelties of our research framework, we will spend some words discussing what we discovered might be the main limitations of our work. In effect, our advice is that the work suffers in particular from three limitations.

The first limit is theoretical. It must be recognized that, though appealing, the different notions of cluster-cycle and the various concepts related to them, still remain somewhat chaotic and fuzzy. It has been argued, more than once, that concepts of clusters' cycle, sequences of evolution and dimensions of change, suffer from ontological reductionism, imprecisions in definition and problems of conceptualisation, therefore, their explanatory leverage remains still limited in many regards. We advise that, the issue was not greatly overcome by the present research. As such, we have gone beyond the long-standing perspective of "four-stages-development" and we have accounted for political and ideological peculiarities, leading to a more flexible understanding of cluster-cycle. Nonetheless, it could be argued that these very insights might render the conceptual frameworks even more chaotic and ambiguous, since depriving these notions from their already modest theoretical bases. In effect, life and adaptive cycle, respectively with their historical dimensions of change, are holistic concepts, which attempt to describe directly the long-term and path-dependent trajectories undertaken by regions. Regional trajectories are, however, complex outcomes of different factors, networks, processes and arrangements, of which the reality in the frameworks is partially simplified, in order to fit with the need of research. Thus, adding further insights to the frameworks might refine them, but also implies the risk to complicate them further and render them less useful for analysis. In other words, in this research it appears particularly problematic to disentangle the applied concepts and frameworks from the complexity of the argument with which they effectively have to deal with.

The second limit - clearly linked with the previous one - is of more methodological nature. Our work suffers from problems of generalization and replicability, since mainly interpretive and inductive, it is, in this sense, still far from furnishing the guidelines for a real all-comprehensive and analytical explanatory framework, useful for the analysis of clusters' cycle and applicable to different empirical contexts. Results and observations were drawn directly from following an inductive perspective, and, although we followed the guidelines given by the frameworks of cluster cycle -and more in general, EEG-, much of our theory emerged directly from the analysis of the case study in question. The present research was carried on without following any pre-fixed and tested framework of analysis, and, the division in stages of Castel Goffredo's history is obviously only one way of interpreting the complex evolutionary process undertaken by the district. The sequence of stages might present other characteristics if analysed with a major emphasis on other factors or parameters. A similar discourse applies for what concerns the analysis of the various historical dimensions: on the one hand, given the huge period of time considered, it was not possible, in this research, to investigate more rigorously, and with a statistical analysis, on the dimensions of heterogeneity and connectivity, which were instead analysed through reports and interviews. If able to track

down sufficiently precise data from the past, studies on technological variety or network analysis, conducted on the different development stages, could give more precise (and replicable) information about the main findings of this research (or they might even contest them); on the other hand, we are aware of the fact that particularly complex, composite and multi-faced notions, such as the various dimensions of change (and, in particular resilience[46]), still remain quite fuzzy concepts, therefore, hardly analysable even with in-depth/descriptive techniques aimed to deal with the most systemic aspects of clusters' evolution. In effect, the study of historical reports, firms' demography and grounded theory is, of course, unable to describe in detail the entire process of cluster development.

Third, we recognize that our approach might present particular challenges on the practical level of the research. In effect, undertaking a (more or less) complete cycle analysis going from the birth to recent days of the cluster was a task far from unproblematic, time-consuming and not possible in all the regards. Performing such historical analysis, requires abundant sources about the past of the case studied, which might be of difficult traceableness or could eventually be unavailable at all. For what concerns our research, for example, it was particularly irksome to rebuild the history of districts development due to many causes: firstly, the scarcity of historical reports expressively aimed to describe the past of the cluster; secondly, the lack in the availability of already-digitalized data for the study of the population of firms in early development stages; thirdly, this work required for its realization the involvement of many other parties external to the academic context, with which the dialogue was not always easy and direct. In sum, compared to other approaches dealing with the study of economic landscapes, it is clear that also the one we chose for this research has its pros and cons, especially from a more practical perspective. While it is true that through an evolutionary cluster-cycle perspective it is possible to consider the development of a cluster more as a dynamic process and in its wholeness, it must be considered that it also required a heterodox way of proceeding, based on a pains-taking collections of data and thorough interpretive analysis.

Horizons for new research and future of the district

In general, concepts of cluster cycle tend to cross with - and, for many extents, comprise - many other notions derived from EEG, the general improvement of its conceptual framework might, in this instance, derive from different directions. As other scholars have suggested

[46]It is a thing well known that resilience remains an issue and topic widely debated by scholars in the field. As argued, for example, by Bristow and Healy (2013) this dimension is not only complex due to its multi-faced nature but also due to its high dependence of contingency, political action and subjective nature of the notion itself. In the present work, we could not go deeper in researching the relevance of agency in the development of the cluster. Thus, the resilience's decline is denoted in the light of events, perceptions and by the fact that the system was overall unable to maintain "good outcomes" (Pendall et al., 2009).

(Menzel and Fornhal, 2009), we mainly advise that, in order to become more useful and reliable tools for clusters' analysis, cluster-cycles still require their application to many other cases and contexts of research - in addition to those few proposed by previous works and in the present dissertation -. Further research is needed in order to shed additional light on the trends of evolution effectively followed by different economic landscapes - like regions and clusters -, which should be analysed with techniques and methodologies able to consider both the most direct (quantitative) and systemic (qualitative) aspects of clusters, which vary through time. In addressing further research, however, we state that - similarly to Martin and Sunley (2011) and Shin and Hassink (2011) - we also remain sceptical about forging a unique realist concept of clusters' cycle effectively able to deal with the multitude of different cases of study. Clusters and regions are, in effect, entities of complex definition, open nature and contextual agency, which are consequently hardly understandable solely through stylized facts and frameworks. Consequently, although defining an appropriate framework remains one of the main aim for future researches (Boschma and Fornhal, 2011), we suggest that scholars should not just align on "one side", but should instead continue to develop such notions in a rather dynamic and inclusive way. In addition, we suggest that the main explanatory leverage of such clusters' cycle theories may rest in the kind of approach which they propose for analysis thus: an historical, in-depth and continuative examination of the periods characterizing the development of a determinate economic landscape - considering its events, dimensions and rationales. Such perspective permits, in fact, a more dynamic and critical interpretation of "how things became what they are" and reveals aspects and issues which are normally neglected by mainstream studies of more "instantaneous" nature.

Related to this, the study of the various dimensions of change should also be continued, but probably by majorly unembedding these latter ones from the syllogism "cycle stage = quantity of dimension". Precisely there is a compelling need of understanding more in deep to what extent dimensions follow evolutionary cycles and influence them. Is it more a matter of quantity or quality that affects the evolution of trjectories? This type of new research would also fit with the idea that a *trade-off* is likely to occur between adaptation (thickness) and adaptability (looseness) for the suitability of economic systems (Boschma, 2014), as well as between different strengths of identities in economic landscapes (Staber and Sautter, 2011). The present research has evidenced that an economic system deprived from a sufficient degree of mediated and planned coordination might perform well temporary thanks to their flexibility, but might be exposed effectively to other threats and risks in the longer run. In this regard, further studies and projects aimed to improve the situation of the district - or conducted on a similar case-study reality - should probably consider that:

- Firstly, since the economic system of the district is in urgent need of an innovative push, exogenous and endogenous potentials are to be considered. In this regard, further research might be conducted in order to identify the possible sectors in which the - till now, narrowly focused - stocking industry might branch or enter in contact with. This, however, should not only imply a mere action aimed to pick up the winners or to gain public investments. Rather, it would consist in a concrete evaluation of possible partners or investors within and outside the district, which might present an interest in the reality of the latter and therefore benefit in terms of business cooperation or knowledge resources. In alternative, entrepreneurial actors and organisations might attempt to diversify more deeply their activities and focus their efforts on activities and businesses not related with the dominant incumbent textile industry. In this sense the shrinkage of the hosiery district could lead to a re-inventing of the cluster and to a more diversified and resilient economy of the region. It goes without saying, however, that such radical shifts could require the developing of competences, structures and professional figures not peculiar of the area, thus, they would probably necessitate more than a simple investment.

- Secondly, in the area should be increased the overall "levels of institutional thickness" aimed to enhance services and innovation. As observed, many of the current problems afflicting the cluster, basically derive from an historical absence on the territory of organisational structures apt to promote a knowledge/innovation empowerment and a platform for firms able to enhance more than simple demand-led relations. The establishing of the R&D centre offering especially analyses and consultancies (the Centro Servizi Calza) was an appropriate but not sufficient move for the needs of the district: there is, in effect, a blatant need of structures able to boost the building up of medium-level skills ready to be employed in the industry - such as technical and managerial colleges -, a thing that, at the present, falls entirely on the firms' initiative and commitment. Renewing the innovation system might also consist in establishing additional formal connections and collaborations with the near mechanical cluster of Brescia and its related engineering and technical university (actors that have been traditionally involved in the history of the district, but rather indirectly, following a bottom-up processes rather than a policy).

- Thirdly (and probably most important), we suggest that a district's recover might difficulty take place by neglecting or leaving out of considerations factors like cultural and political orientations, local cohesion, social capital or the overall quality

of relations between actors of various types. As understood, in fact, much of historical district's weaknesses essentially came from the presence of an unfavourable socio-cultural environment, often characterized by high competition and shrinkage of interests. In first instance, the long-standing "cut-throat rivalry" between stocking industries should be appeased in favour of a more fruitful dialogue between private economic actors: precisely, entrepreneurs should probably consider the fact of being located in a cluster, more as an opportunity, rather than a challenge solely. Nonetheless, it is crucial to restore the bond of trust between the local firms and the roaming institutions, which, according to what found, deteriorated especially in recent decades. As such, it is also much desirable the creation of new networks and formal organisations able to reinforce the identity of the industrial area as well as keeping in contact the different actors and parties forming the cluster itself.

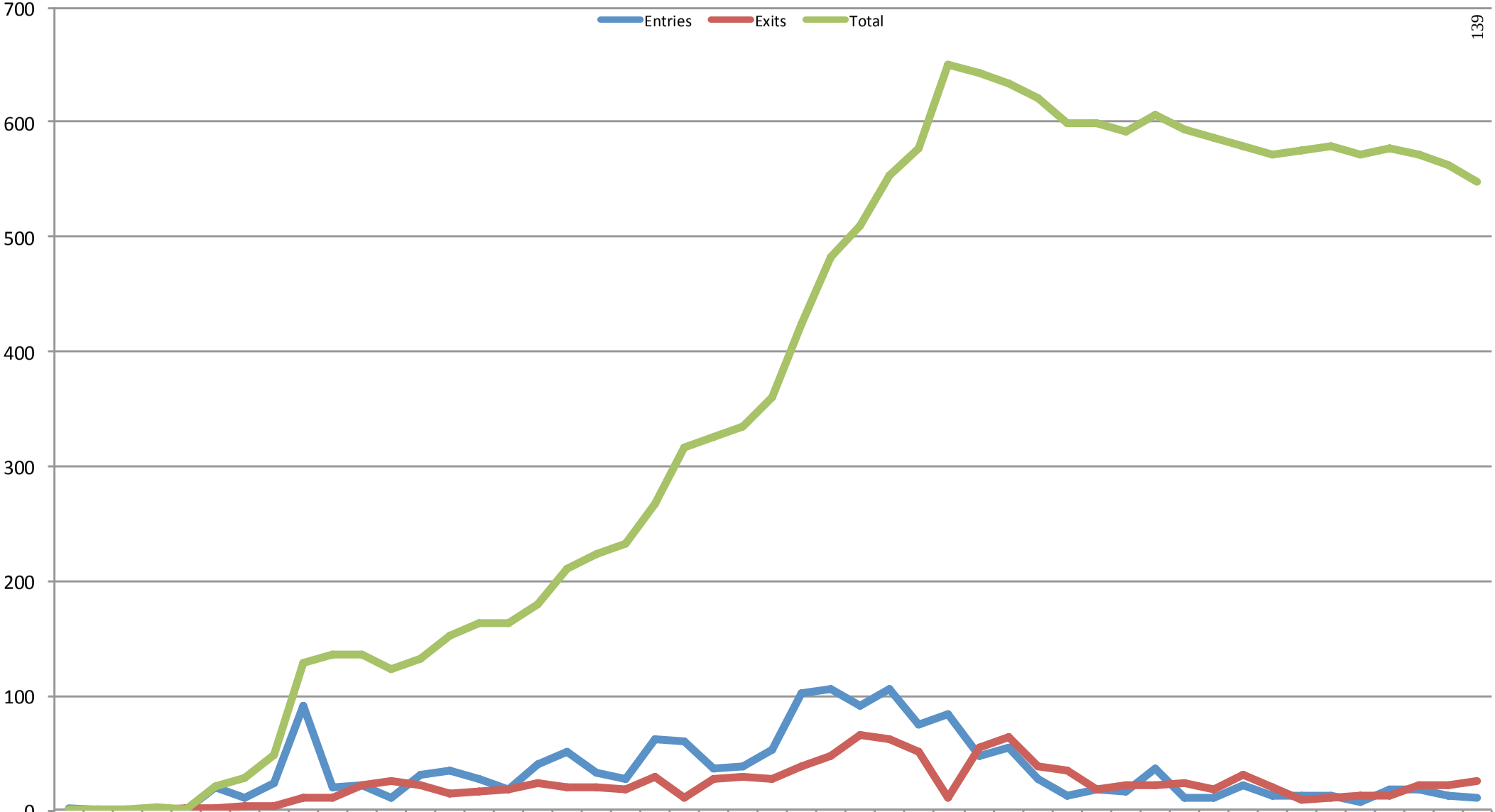
In sum, what remains clear is that the district must break through the long-standing trap of overspecialization that often affects peripheral area. Yet, since such significant changes and radical innovations processes are hardly faceable by firms in solitary (especially in such period of global economic crisis), what should be contrasted or at least questioned in first place is the opportunistic and individualistic behaviour of firms; this associated with the continuous seeking of short-term profits that does not permit the fulfilment of more durable, sustainable and engaging shared plans. The recent emergence of organisations like the "NOEMI trust project", an organisation mostly backed by a significant number of local entrepreneurs - and which goals are similar to the advices proposed in the following research -, witnesses that (although with a huge delay) a part of the cluster's plurality has effectively became recently aware of such limitations. In view of future policies and interventions, however, we stress that the experts in charge should be more concerned of giving solutions based on larger-scale efforts and deeper understanding of current issues. Precisely, in addition to give an answer about "how to solve the problem", it would be probably convenient to pose first a question about "how the problem came to be". In line with such experience, in future researches it might be interesting to compare clusters, which, despite their inherent similarities in structure and industrial theme, have exhibited cycles of evolution clearly different from each other. Analysing different cycle cases from an historical perspective might effectively offer precise insights about the factors and events that effectively brought some districts to be more resilient and adaptable of others in face of both endogenous economic changes and external shocks. Moreover, such approach would permit further empirical enrichments of clusters' cycle conceptual framework. Still considering the district of Castel Goffredo, it could be of particular interest to make a comparison between the cluster

and other industrial realities based on textiles and SMEs: as for example the region of Westmunsterland, recently studied by Hassink (2007). In fact, although similar in industrial theme, structure, rural reality and entrepreneurial culture, it appears that the region of Castel Goffredo was definitely less able to face economic changes that its German counterpart. As such, by reviewing and comparing in-depth the two evolutionary cycles it would be possible to make hypothesis and assumptions on some of the events, causes and determinants which brought to substantially different paths of the two economic landscapes.

After all, the modern fabrication of textiles is still based on threads which, starting from yarns, are further laboured by machineries in different steps. Whenever occurs a break down or a defection in the finite product, technicians -rather than fixing the problem a posteriori- often have to retrace the phases of production in order to understand what is the source of the problem. This, should be considered also at the macro-level, when investigating the problems at the base of clusters' maintenance…

Appendix: Graphs and statistics

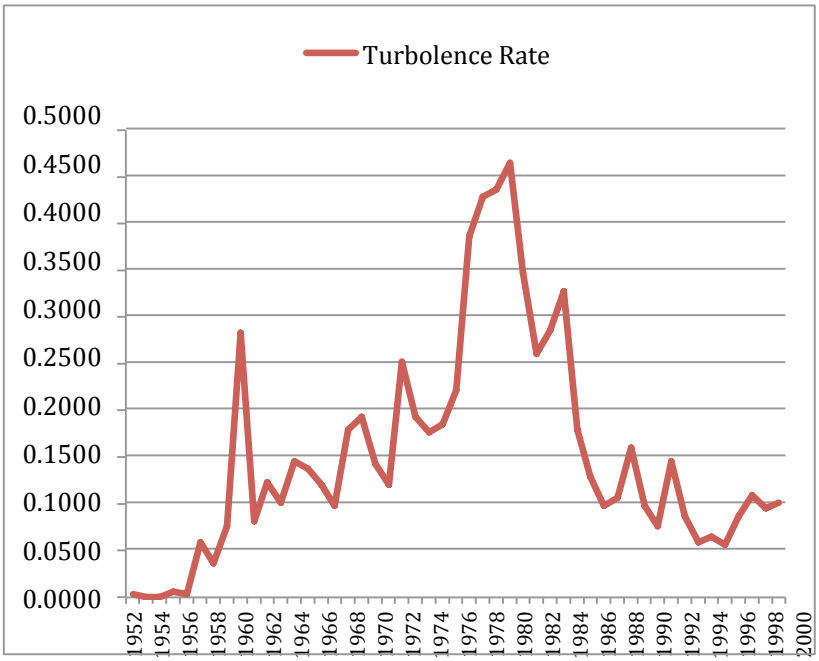
Total firms entrance/exits

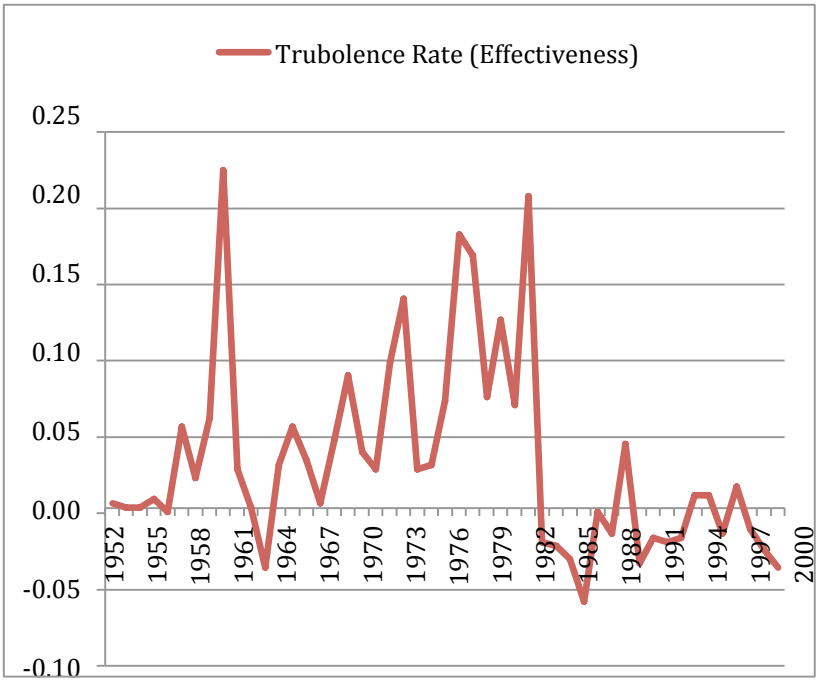


	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Entries	1	0	0	2	0	20	10	24	90	19	22	11	31	34	27	18	40	50	32	26	62	59	36	38	52	101	106	91	105	74	83	47	54	26	12	17	16	36	11	10	22	12	12	13	7	18	17	12	11
Exits	0	0	0	0	1	1	3	3	11	10	22	25	21	15	16	17	24	19	19	17	28	10	27	28	27	37	47	65	61	50	10	55	63	38	34	18	22	21	24	17	30	19	9	10	13	13	22	22	25
Total	1	1	1	3	2	21	28	49	128	137	137	123	133	152	163	164	180	211	224	233	267	316	325	335	360	424	483	509	553	577	650	642	633	621	599	598	592	607	594	587	579	572	575	578	572	577	572	562	548

Total firms

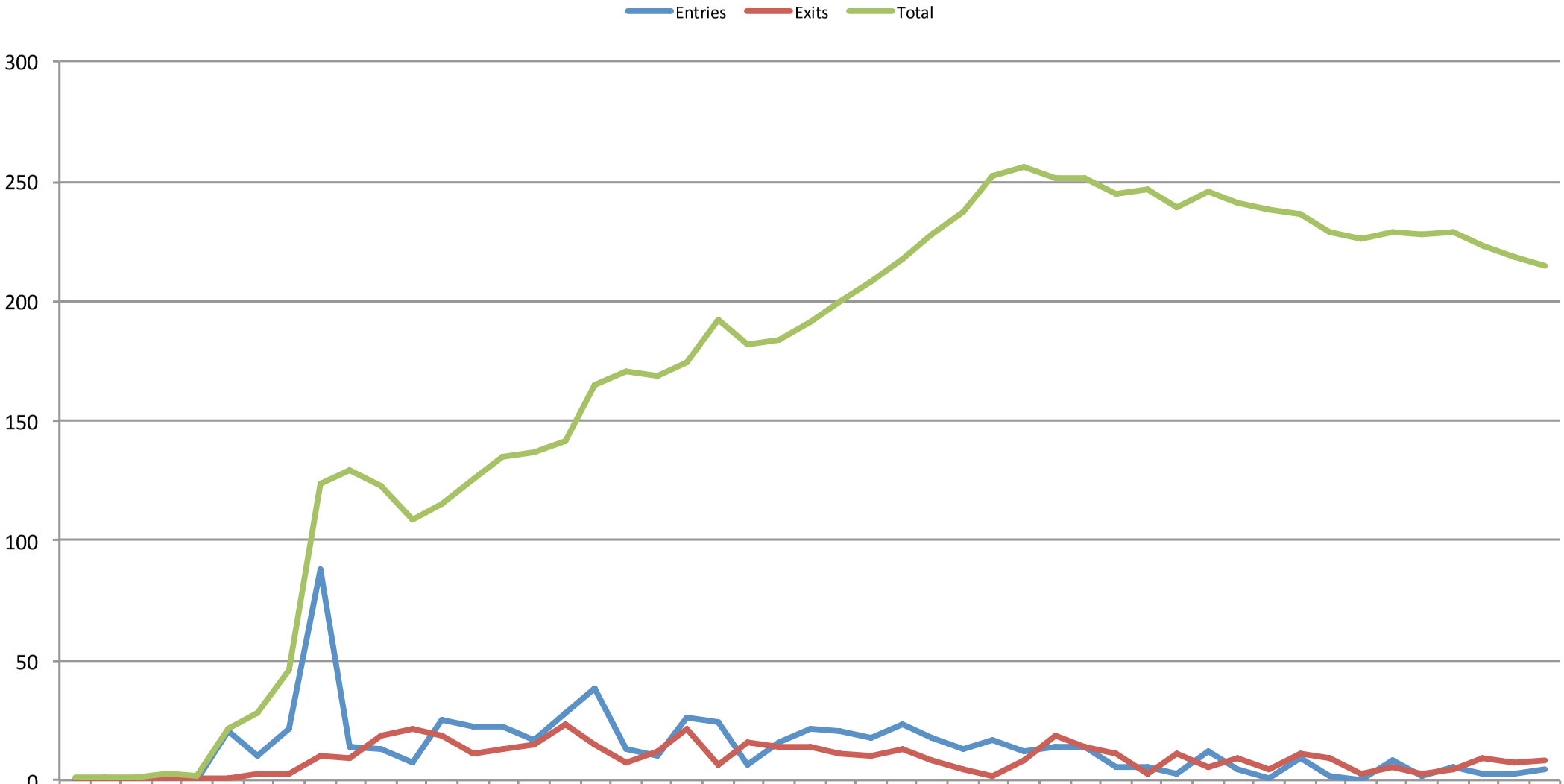
Year	Turbolence Rate	Turbolence Rate (Effectiveness)
1952	0,0028	0,00
1953	0,0000	0,00
1954	0,0000	0,00
1955	0,0056	0,01
1956	0,0028	0,00
1957	0,0588	0,05
1958	0,0364	0,02
1959	0,0756	0,06
1960	0,2828	0,22
1961	0,0812	0,03
1962	0,1232	0,00
1963	0,1008	-0,04
1964	0,1456	0,03
1965	0,1372	0,05
1966	0,1204	0,03
1967	0,0980	0,00
1968	0,1792	0,04
1969	0,1932	0,09
1970	0,1428	0,04
1971	0,1204	0,03
1972	0,2520	0,10
1973	0,1932	0,14
1974	0,1764	0,03
1975	0,1848	0,03
1976	0,2212	0,07
1977	0,3864	0,18
1978	0,4284	0,17
1979	0,4368	0,07
1980	0,4649	0,12
1981	0,3472	0,07
1982	0,2604	0,20
1983	0,2856	-0,02
1984	0,3276	-0,03
1985	0,1792	-0,03
1986	0,1288	-0,06
1987	0,0980	0,00
1988	0,1064	-0,02
1989	0,1596	0,04
1990	0,0980	-0,04
1991	0,0756	-0,02
1992	0,1456	-0,02
1993	0,0868	-0,02
1994	0,0588	0,01
1995	0,0644	0,01
1996	0,0560	-0,02
1997	0,0868	0,01
1998	0,1092	-0,01
1999	0,0952	-0,03
2000	0,1008	-0,04





Period	Av.rate	Av.rate (effectiveness)
1952-1956	0,0022	0,0024
1957-1974	0,1399	0,0593
1975-1987	0,2884	0,0297
1988-2000	0,0956	-0,0146

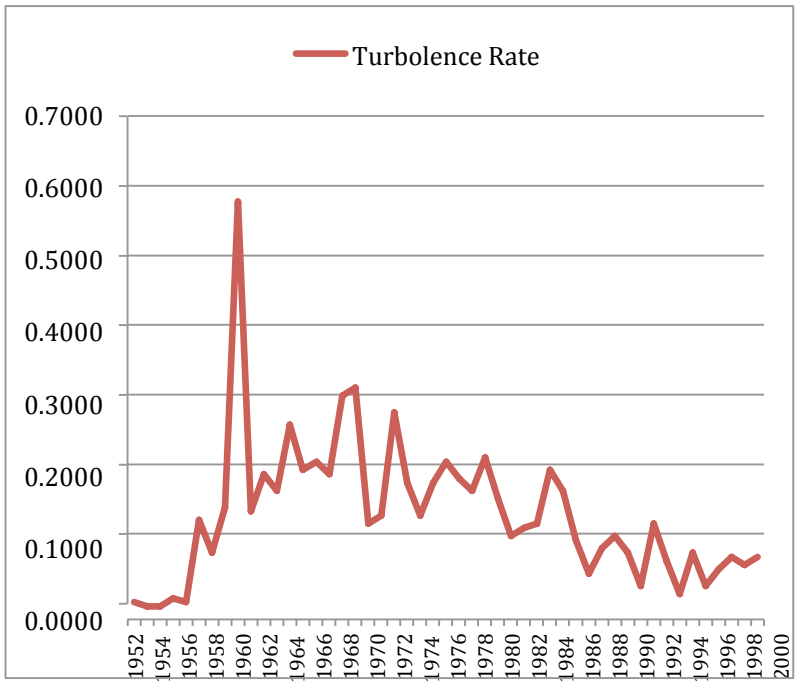
Total stocking firms entrance/exits

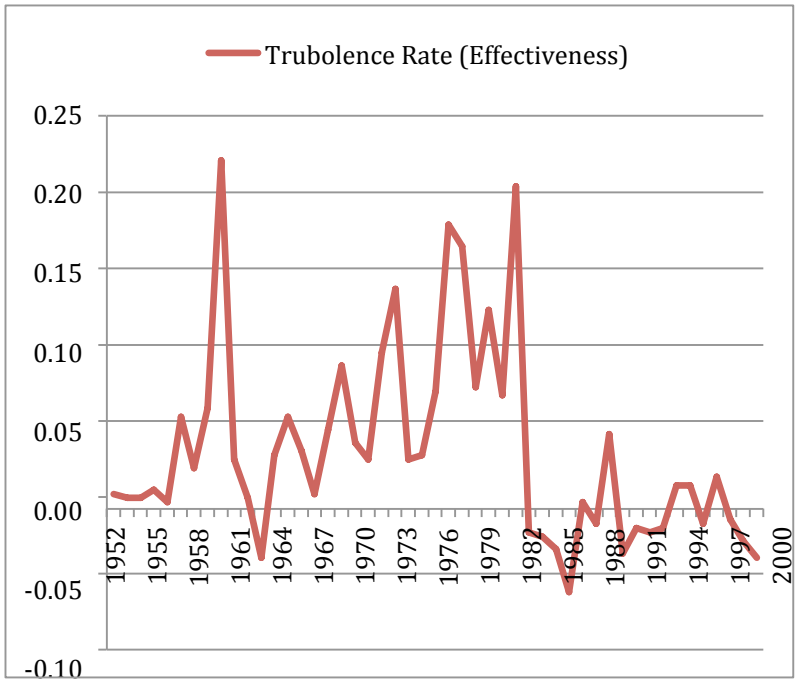


	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Entries	1	0	0	2	0	20	10	21	88	14	13	7	25	22	22	17	28	38	13	10	26	24	6	16	21	20	18	23	18	13	17	12	14	14	5	5	3	12	4	1	9	2	0	8	2	5	3	3	4
Exits	0	0	0	0	1	1	3	3	10	9	19	21	19	11	13	15	23	15	7	12	21	6	16	14	14	11	10	13	8	4	2	8	19	14	11	3	11	5	9	4	11	9	3	5	3	4	9	7	8
Total	1	1	1	3	2	21	28	46	124	129	123	109	115	126	135	137	142	165	171	169	174	192	182	184	191	200	208	218	228	237	252	256	251	251	245	247	239	246	241	238	236	229	226	229	228	229	223	219	215

Stocking firms

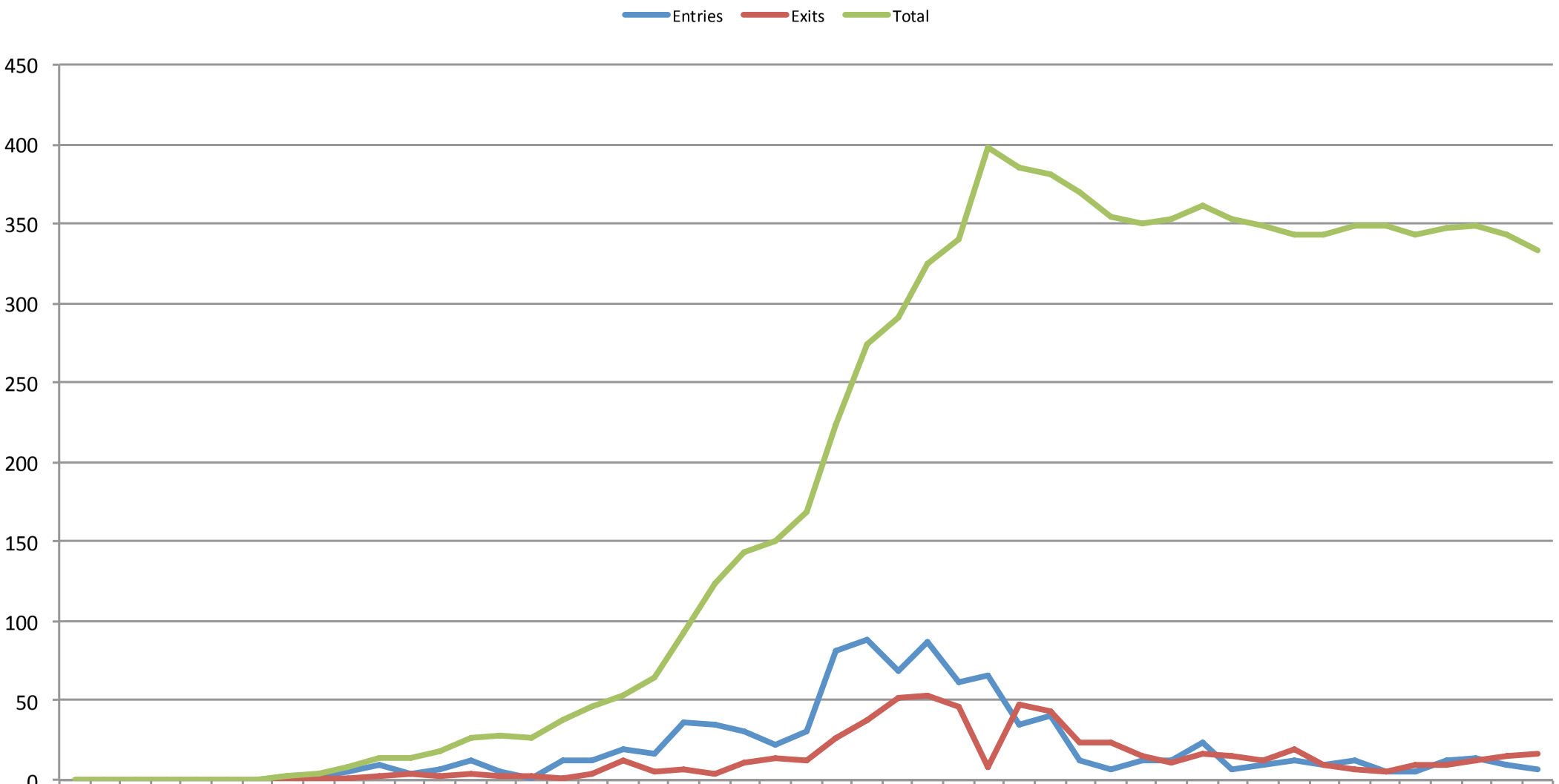
Year	Turbolence Rate	Turbolence Rate (Effectiveness)
1952	0,0059	0,0028
1953	0,0000	0,0000
1954	0,0000	0,0000
1955	0,0119	0,0056
1956	0,0059	-0,0028
1957	0,1245	0,0532
1958	0,0771	0,0196
1959	0,1423	0,0588
1960	0,5812	0,2212
1961	0,1364	0,0252
1962	0,1898	0,0000
1963	0,1661	-0,0392
1964	0,2610	0,0280
1965	0,1957	0,0532
1966	0,2076	0,0308
1967	0,1898	0,0028
1968	0,3025	0,0448
1969	0,3143	0,0868
1970	0,1186	0,0364
1971	0,1305	0,0252
1972	0,2787	0,0952
1973	0,1779	0,1372
1974	0,1305	0,0252
1975	0,1779	0,0280
1976	0,2076	0,0700
1977	0,1839	0,1792
1978	0,1661	0,1652
1979	0,2135	0,0728
1980	0,1542	0,1232
1981	0,1008	0,0672
1982	0,1127	0,2044
1983	0,1186	-0,0224
1984	0,1957	-0,0252
1985	0,1661	-0,0336
1986	0,0949	-0,0616
1987	0,0474	-0,0028
1988	0,0830	-0,0168
1989	0,1008	0,0420
1990	0,0771	-0,0364
1991	0,0297	-0,0196
1992	0,1186	-0,0224
1993	0,0652	-0,0196
1994	0,0178	0,0084
1995	0,0771	0,0084
1996	0,0297	-0,0168
1997	0,0534	0,0140
1998	0,0712	-0,0140
1999	0,0593	-0,0280
2000	0,0712	-0,0392





Period	Av.rate	Av.rate (effectiveness)
1952-1956	0,0047	0,0024
1957-1974	0,2069	0,0593
1975-1987	0,1492	0,0297
1988-2000	0,0657	-0,0146

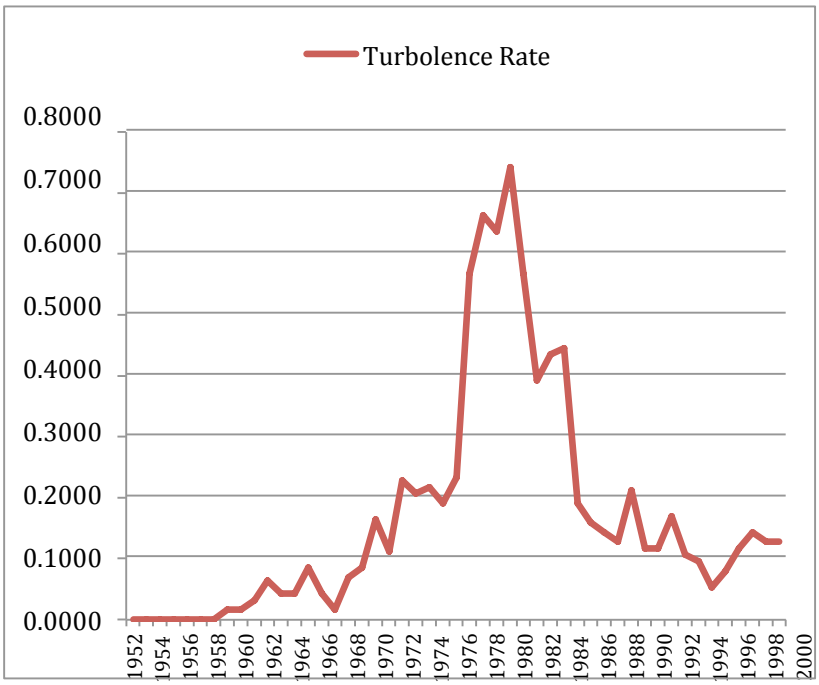
Total subcontractors entrance/exits

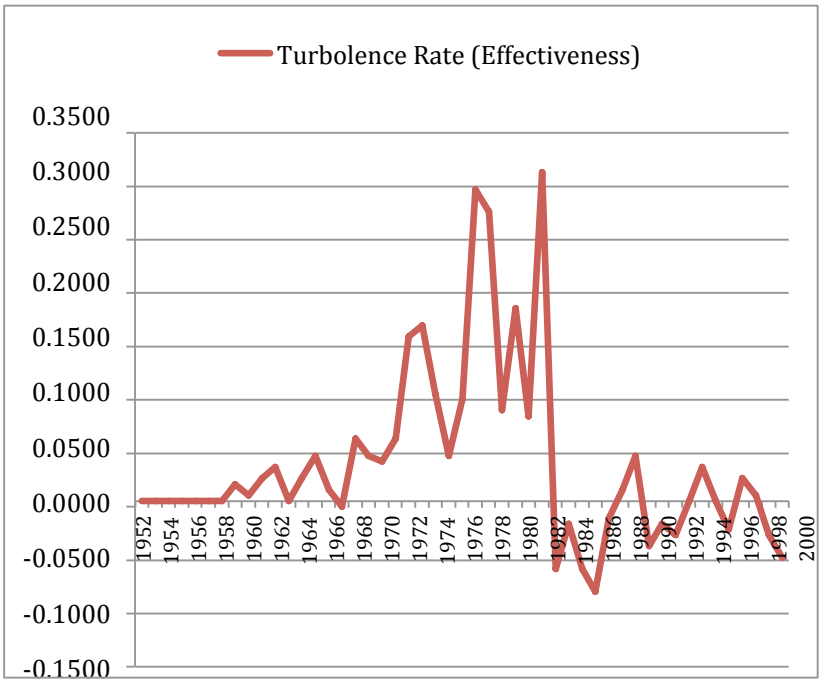


	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Entries	0	0	0	0	0	0	0	3	2	5	9	4	6	12	5	1	12	12	19	16	36	35	30	22	31	81	88	68	87	61	66	35	40	12	7	12	13	24	7	9	13	10	12	5	5	13	14	9	7
Exits	0	0	0	0	0	0	0	0	1	1	3	4	2	4	3	2	1	4	12	5	7	4	11	14	13	26	37	52	53	46	8	47	44	24	23	15	11	16	15	13	19	10	6	5	10	9	13	15	17
Total	0	0	0	0	0	0	0	3	4	8	14	14	18	26	28	27	38	46	53	64	93	124	143	151	169	224	275	291	325	340	398	386	382	370	354	351	353	361	353	349	343	343	349	349	344	348	349	343	333

Subcontractors

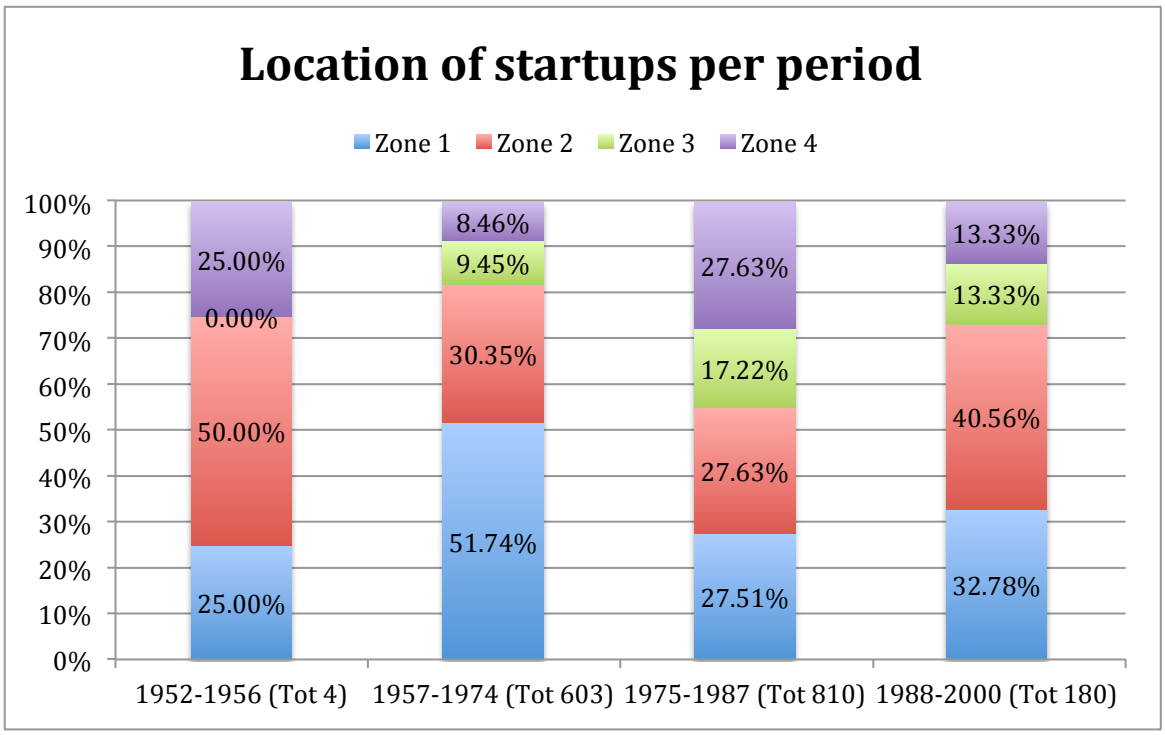
Year	Turbolence Rate	Turbolence Rate (Effectiveness)
1952	0,0000	0,0000
1953	0,0000	0,0000
1954	0,0000	0,0000
1955	0,0000	0,0000
1956	0,0000	0,0000
1957	0,0000	0,0000
1958	0,0000	0,0000
1959	0,0159	0,0159
1960	0,0159	0,0053
1961	0,0318	0,0212
1962	0,0637	0,0318
1963	0,0424	0,0000
1964	0,0424	0,0212
1965	0,0849	0,0424
1966	0,0424	0,0106
1967	0,0159	-0,0053
1968	0,0690	0,0584
1969	0,0849	0,0424
1970	0,1645	0,0371
1971	0,1114	0,0584
1972	0,2281	0,1539
1973	0,2069	0,1645
1974	0,2175	0,1008
1975	0,1910	0,0424
1976	0,2334	0,0955
1977	0,5677	0,2918
1978	0,6632	0,2706
1979	0,6366	0,0849
1980	0,7427	0,1804
1981	0,5677	0,0796
1982	0,3926	0,3077
1983	0,4350	-0,0637
1984	0,4456	-0,0212
1985	0,1910	-0,0637
1986	0,1592	-0,0849
1987	0,1432	-0,0159
1988	0,1273	0,0106
1989	0,2122	0,0424
1990	0,1167	-0,0424
1991	0,1167	-0,0212
1992	0,1698	-0,0318
1993	0,1061	0,0000
1994	0,0955	0,0318
1995	0,0531	0,0000
1996	0,0796	-0,0265
1997	0,1167	0,0212
1998	0,1432	0,0053
1999	0,1273	-0,0318
2000	0,1273	-0,0531





Period	Av.rate	Av.rate (effectiveness)
1952-1956	0,0000	0,0000
1957-1974	0,0799	0,0421
1975-1987	0,4130	0,0849
1988-2000	0,1224	-0,0073

Periods	Entries Z1	Entries Z2	Entries Z3	Entries Z4
1952-1956	1	2	0	1
1957-1974	312	183	57	51
1975-1987	222	223	139	223
1988-2000	59	73	24	24



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