

# 1. Introduction: Towards a Political Perspective and Unifying Concept

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## 1. AIMS AND PERSPECTIVES

In recent years local networks of firms, implying cooperation, and the interaction of these networks with local institutions have received increasing attention from scientists as well as from policy makers. Currently, the latter frequently focus on them in an attempt to create industrial districts or clusters. For example, the German Federal Ministry of Education and Research has implemented several programmes that focus on local institutions and networks to support the emergence of successful regions.

This book is a result of the research project financed by the German Ministry under one of these programmes. The authors were invited to a workshop at the Max Planck Institute for Research into Economic Systems in Jena, where the different aspects relating to the development of local industrial clusters and their relevance for policy making were discussed. The major task of the workshop and the related research was to advise the Ministry on how to support the emergence of local industrial clusters in the Neue Länder (former GDR).

The aim of this book is determined by the question posed by the German Ministry: how can the emergence of local industrial clusters be triggered by policy measures? The central question faced by the Ministry is how clusters can be obtained in the Neue Länder with their specific history. Where and how should policy interfere positively? The situations differ strongly between regions in the Neue Länder: some regions do better than others, some have a strong history in certain industries, some show promising recent developments and some are lagging behind with no signs of catching up. How should policy deal with these various situations?

Currently, it is widely believed by researchers that the emergence of local industrial clusters is a complex process in which many different aspects and processes are involved. It is not sufficient to give a few policy recommendations,

which are linked to isolated processes, and which do not consider the complex nature of cluster emergence and development. Therefore, this book has been produced in order to give a more comprehensive overview on these factors and the possibilities that policy makers will influence them.

In order to address the central question of whether and how it is possible to trigger the emergence of local industrial clusters, several other questions have to be answered. Some of these answers are, of course, already given in the huge literature on industrial districts, innovative milieux, clusters and innovative regional innovation systems that have appeared in recent years.

However, the questions usually addressed deviate from the central question of this book. The existing literature aims to answer two questions. First, it studies which characteristics of regions cause the emergence of industrial districts, innovative milieux and the like. These inquiries are usually based on case studies, in which region-specific prerequisites are analysed (see, for example, a broad collection of case studies on regional innovation system in Braczyk, Cooke and Heidenreich 1998 or on industrial districts in Pyke and Sengenberger 1992). Many different prerequisites are identified, for example, the specific situation of farmers (Bagnasco 1977; Trigilia 1992), the existence of research institutes and universities (Porter 1990; Florax 1992; Dalum 1995; Garnsey 1998), the availability of venture capital (Florida and Kenney 1988; Garnsey 1998), the entrepreneurial attitude in a region (Fumagalli and Mussati 1993), the specificity of local markets (Porter 1990) and the influence of policy makers (Markusen and Park 1993).

Second, it examines why those regions are successful, meaning that the local mechanisms leading to the economic success of these regions are investigated. Most of the conceptual works in the theoretical literature focus on local self-augmenting processes. These are assumed to make regions successful and sustain their advantage over other regions. Many different mechanisms are discussed that might cause such self-augmenting processes. Examples are the accumulation of human capital and local tacit knowledge (von Hippel 1994; Morgan 1997; Maskell and Malmberg 1999), spillovers and local knowledge transfer between firms (Jaffe et al. 1993; Audretsch and Stephan 1999; Braunerhjelm and Carlsson 1999), interdependencies and contracts between firms and their suppliers, customers or service providers (Aydalot and Keeble 1988; Storper 1995), cooperation between local firms (Sengenberger and Pyke 1992; Vou and Wilkinson 1994; Cooke 1996), and the interaction between the economic developments and the social relationships and attitudes in a region (Becattini 1990; Putnam 1993).

Both questions addressed in this study are related to the central question dealt with, but are not identical. Hence, the findings can be used, but have to be supplemented by further research and analyses.

As was presented, the results obtained in the above cited literature are very heterogeneous. The approaches taken focus on different local mechanisms. This implies that policy makers have to decide which of these mechanisms they want to concentrate on. However, such a focus on only one concept, and therefore a few mechanisms, restricts the political possibilities. A more general approach, on the other hand, requires a unifying theoretical concept. So far there are only a few attempts that aim to establish such a unification (for example Curzio and Fortis 2002; Garnsey 1998). This book heads in the same direction.

Case studies, however, show that the involved mechanisms differ. This is caused by differences between industries, regions, countries and times. All aspects of the lists of potential prerequisites and local self-augmenting processes that are given above might be important. Thus, a unifying theory should take all of them into consideration. However, not all of them can be considered in each policy approach. Thus, scientific progress is necessary with respect to two different aspects.

First, it is important to understand the workings of the different local mechanisms in more detail. Especially, it has to be identified under which circumstances, in which countries and industries and at what times, which mechanisms are important. It is not sufficient to know that they are important in some specific cases. It is necessary to know in which cases and at what times they are relevant.

Second, it is necessary to identify those aspects that can be influenced by policy measures. This restricts the aspects that have to be taken into consideration. Some prerequisites exist that cannot be subject to policy measures. These factors might play a role for the potential success of political interventions, but cannot be altered by policy makers. This means that it is not only important to know what kind of policy measure should be taken, but also to understand in which cases and at which times this should be done.

The above argumentation implies that the observation of a strong heterogeneity among the cases studied empirically has to be transferred to the policy perspective. Although there might be a unifying theory, there is surely no general way of adequately supporting the emergence of local industrial clusters.

Especially, time should be taken into account much more than it has been done so far in the literature. Time influences the effectiveness of policy measures in several ways. First, the importance of different local mechanisms changes over time. Second, the market situation and the technological development in industries play an important role for the emergence of local clusters. These also change over time in each industry. Finally, the emergence of local industrial clusters is a process. This means that the impact and effectiveness of policy measures change during the development of clusters. At different times within this development, different policy measures have to be applied.

All this has not been sufficiently studied so far. Although the respective scientists agree that the cases analysed differ, the impact of different circumstances and times are not examined systematically. We think that such studies are important in the context outlined here and some first steps are taken in this book. This requires a new perspective that considers different local processes and aspects, different times and the possibilities of policy making to influence local dynamics under different conditions.

## 2. UNIFYING CONCEPT AND THE EVOLUTION OF LOCAL CLUSTERS

The perspective that we propose considers the emergence of local clusters as a dynamic process with different stages at which different mechanisms play a role (a mathematical model of this process is given in Brenner 2001). According to this perspective, the emergence of local industrial clusters is triggered by certain developments in an industry, usually increases of demand or technological changes. As a consequence, new firms are founded and existing firms grow. If the industry satisfies certain conditions, the firms do not appear in a geographically scattered way, but form local clusters.

The location of these clusters is influenced by several aspects. First, some regions have advantages, while others have disadvantages. These advantages and disadvantages take different forms, which range from their geographical location to the existence of certain institutions within the region. Policy measures might influence the attractiveness of regions and therefore increase the likelihood that industrial clusters emerge at a certain place.

Second, while the dynamics within an industry are triggered by changes in the market or the technology, the dynamics within regions are triggered by one or a few people who found a firm or take the first activities with respect to a flourishing market or new technology. On the one hand, these initial developments depend on the existence of the respective people in a region, which cannot be caused by short-term policy measures. On the other hand, the respective people have to be motivated to take these actions. This in turn might be influenced by policy measures.

Third, the initial developments are amplified by local self-augmenting processes, like the accumulation of human capital, spin-offs, spillovers and local synergies. These processes might differ between regions and might influence the outcome of the competition between potential clusters. Policy measures might also support the self-augmenting processes in certain regions to influence the place where a cluster emerges.

The three aspects listed above are relevant at different times within the emergence of local industrial clusters. Advantages and disadvantages influence

the starting point of regions, initial developments are necessary to trigger the processes and the self-augmenting mechanisms determine the further developments once the process has been started.

The timing of the whole process is determined by market developments and technological changes. Policy makers are only able to react to these developments and increase the likelihood of positive future developments on the basis of the current situation. For example, it is not effective to support self-augmenting processes in a region where no initial developments have appeared. Similarly, in general, the emergence of a local cluster cannot be successfully triggered in an industry that faces decreasing demand.

Many of the aspects mentioned above have already been analysed in the literature. However, this has not been done from the perspective outlined above. Therefore, the findings have to be reconsidered, different aspects have to be stressed and gaps filled. Finally, different policy measures applied at different stages have to be examined.

### 3. ORGANISATION OF CHAPTERS

This book gives an overview but also tries to assemble some of the necessary elements for the above demanded unifying concept and to open up some new directions of thought. New views have to be taken into account in order to progress in the suggested direction.

Accordingly, the book consists of three parts that are linked to each other. Part I contains theoretical approaches. In Part II case studies are presented. Finally, Part III contains the policy-oriented contributions. However, many of the chapters combine empirical, theoretical and political aspects. They are sorted according to their main concern, and a detailed description of them is given below. Especially in the context of local networks and their interaction with local institutions quite different opinions can still be found. Since this cannot all be included in one book, we attempt to present some new insights in this study. Further work and progress is necessary in this research field.

#### 3.1 Important Local Processes in the Theoretical Part

The theoretical approaches develop an understanding of the initial conditions and the self-augmenting processes from different perspectives. Such an approach seems necessary to answer the question of how policy can influence these factors.

Regions differ in their attractiveness and in their starting points. This can be related to many aspects, one of which is dealt with here, namely the different starting points caused by cultural factors: Sylvianne Pilon and Chris DeBresson

point out in Chapter 2 the importance of culture for local development and distinguish three main impacts: (1) the impact of culture on the spread of incubator firms; (2) the acceleration of local learning processes; and (3) transaction and coordination costs. This shows that culture strongly influences the early processes in regions that trigger the emergence of local clusters, but also influences the self-augmenting processes that stabilise local clusters and make them economically successful. The former influence is decisive for the question of where local clusters emerge.

Entrepreneurial activities are especially important at this early stage of the development of local clusters. The attitude towards entrepreneurship does not only depend on the local culture but also on social-cognitive learning processes. Dirk Fornahl in Chapter 3 addresses the question of how cognitive representations and mental processes of individual agents can influence regional entrepreneurial activities. The argument put forward in this chapter is that these cognitive factors and the related likelihood of discovering entrepreneurial opportunities and increasing the willingness to start a new firm is strongly influenced by positive examples, so-called models, present in regions. The issue of start-ups is again taken up by Knut Koschatzky in Chapter 3 (Part III).

Three chapters are linked to the influence of cooperation, coordination and knowledge transfer that are a central mechanism in triggering local self-augmenting processes. In addition, Chapter 14 by Fabrizio Barca discusses these aspects from a policy perspective that are presented later in Part III.

Cooperation and coordination often play an important role in obtaining a necessary momentum in a region. In many cases they trigger the local processes and thus enable the emergence of local clusters. In addition, cooperation also represents a self-augmenting process that causes firms to profit from co-location. Therefore, it is important to understand the processes of cooperation and coordination. Further self-augmenting processes, like the accumulation of human capital in firms and the technological interdependence between certain firms, exist. These, however, can rarely be influenced by policy measures, so that they are of less interest in the study.

Reinhard Bachmann in Chapter 4 analyses the importance of trust and power for the occurrence of cooperation. Specific forms of trust and power are identified and the institutional environment seems to play a crucial role in shaping the quality of trans-organizational relations. Mark Lorenzen and Nicolai J. Foss in Chapter 5 focus on the cognitive dimension of institutions that allows agents to coordinate economic actions. Cognitive coordination problems emerge when agents have incomplete and different beliefs about each other. Such problems can be solved if all the agents involved have a common focal point.

Another aspect that causes firms to profit from co-location is the existence of knowledge transfers. Bart Nooteboom in Chapter 6 builds his approach on two variables that both influence the innovative activities of regions or other systems:

on the one hand, the knowledge transfer from one organizational unit to another and on the other hand, the issue of governance.

A new direction of research is taken by Paolo Seri in Chapter 7 in a theoretical approach to explain the opposite of successful regions, namely the persistent backwardness of certain regions. In most cases successful regions have a vision of their future development as an important initial starting point. The leading question in this paper is how new things can get started if old ones dominate. Two main reasons for such rigidities are put forward: cognitive anchoring and compartmentalisation. Both have to be taken into consideration if policy programmes are to be implemented to change and foster regional development.

Finally, the question of how to define the geographical borders of local systems on the basis of networks is discussed by Deborah Tappi in Chapter 8. She argues that an adequate definition of local units should reflect both the local labour market areas and the existence of networks. This is of importance because one has to know which area to choose and which spatial factors to take into consideration if policy measures are to be applied to only one region.

### **3.2 Different Stages of the Processes in the Empirical Part**

Instead of describing the characteristics of successful local systems, which is necessary but has been done extensively in the existing literature, the case studies presented here focus on the different stages of the evolution of clusters. These stages differ with respect to the local conditions and the self-augmenting processes at work. Since policy makers might step in, in all the stages, the policy measures applied must be adapted to the current situation. An understanding of the different stages is necessary to do this.

Meine Pieter van Dijk in Chapter 9 presents a case study of information technology (IT) enterprises in Nanjing (China). The high concentration of IT firms in the city can be regarded as an emerging cluster that benefits from the proximity of local traders. The situation he describes is that of an emerging cluster that might or might not develop further in the future. He gives some hints about the policy measures that are important to support further development.

The situation of an existing cluster that faces competition from other clusters is studied by Anja Lutz, Jörg Sydow and Udo Staber in Chapter 10. They analyse the impact of policy and 'institution thickness' on the comparative development of regional innovation systems. As cases they use the TV production in two German media regions. The central concept in their analysis is 'institutional thickness', meaning the intensity of institutional interactions between various actors, which has an impact on regional cooperation and innovation. They discuss how policy influences this 'institutional thickness' and thus the further development of the clusters.

If the exogenous conditions change, local clusters have to adapt to the new conditions. This is not always an easy process. A successful story is presented by Francesco Lissoni and Massimo Pagani in Chapter 11. They describe the long history of the hosiery machine cluster of Brescia (Italy) that has transformed itself over time. The chapter focuses on innovation networks and the importance of such networks for the development of local systems. It points out that there is a simultaneous existence of several firm networks within one region and a co-evolution of industries. They especially point out the user-producer interactions and their impact on innovations in the region.

An unsuccessful story is presented by Arne Isaksen in Chapter 12. He focuses on a declining cluster that was formerly successful; the offshore engineering in the Oslo region. Isaksen explains the decline by a functional and technological 'lock-in' to the techno-economic path of building large platforms. Furthermore, he gives some suggestions how the downturn could have been avoided.

### **3.3 How can Policy Influence Cluster-related Processes?**

The literature still gives insufficient guidance about how political measures and programmes should be designed in order to create and support local industrial clusters. The three chapters in Part III are directly related to such policy issues.

As was presented, the initial conditions are relevant for cluster formation. Knut Koschatzky in Chapter 13 focuses on this aspect by analysing how the number of university-based start-ups in a region can be positively influenced by political intervention. He analyses the EXIST programme launched by the German Federal Ministry of Education and Research in 1997 that was designed to support entrepreneurial education and start-up processes in some regions. Further work has to be done to examine other initial conditions like the education system, universities or research institutes.

Fabrizio Barca in Chapter 14 in turn deals with the region's inherent self-augmenting processes. He makes a proposal of how to design programmes to support some of these processes. The example he uses is a policy plan based on 'territorial competitiveness policies' introduced in the Italian Mezzogiorno region. The coordination of activities and communication processes are at the core of his research. Knowledge transfer is another relevant self-augmenting process for which a sound analysis should be made and related policy recommendations could be given in the future.

Thomas Brenner in Chapter 15 addresses the problem of how policy measures must be timed in order to support the initial conditions or the self-augmenting processes successfully. In order to do so, he identifies local self-augmenting processes and possible policy interventions whose interaction and regional impact he simulates in a computer model. On this meta-level there exist more problems to be solved. Important issues are whether a special region should be

chosen for a focused support, how regions should be chosen and which local aspects should be supported.

#### 4. OUTLOOK

Much of the existing literature has concentrated on the analysis of existing systems that has led to knowledge about various reasons for success and problems a region can face. Hence, the existing studies mainly offer a description of local systems with some attempts to generalize certain processes.

This book tries to take a unifying approach and to refocus on policy issues and aspects that have to be understood better to apply policy measures successfully. It takes a first step, but further work is necessary to fill the gaps mentioned above. Three questions seem to be of special relevance in this context. First, more knowledge is required about how and which conditions and local mechanisms involved in the emergence of local clusters can be influenced by policies. Some answers are provided in this book; however, many remain unanswered. Second, we have to understand better when and where policy measures should be applied. The success of policy measures crucially depends on the interplay of the situation given in a region and industry and the measures applied. This interplay is still not sufficiently understood. Third, several programmes have been conducted in recent years. This should be used to collect scientific knowledge about the functioning and success of different programmes. Some of the chapters in this volume offer such knowledge. The aim should be to condense such knowledge and develop more detailed advice about how such programmes should be designed. Hopefully, this volume will trigger further research to answer these questions.

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