

## **Cluster and Network Initiatives in a Post-Transition Economy: The Case of Germany's South Eastern Region\***

by

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### **Abstract:**

The contribution is focused on cluster and network initiatives which have been established during the post-transition period in the south eastern part of Germany, in and around the cities of Leipzig, Halle, Dresden and Chemnitz. The research focus is of relevance, since the collapse of the centrally planned East German economy has led to a disruption of networks between the formerly state-owned enterprises. The contribution analyses main characteristics of cluster and network initiatives: targets, industrial and spatial coverage, and the inclusion of public research units. The findings show that not all of the cluster and network initiatives under consideration are backed by an actual economic potential.

## 1. Introduction

Clustering and networking initiatives matter. Policy makers worldwide have begun to regard clustering and networking as bearers of hope for improving regional development. Thus, initiatives to foster clustering and networking have become an important tool of industrial and regional policy in many countries worldwide. This is the case with so called post transition economies, too (cf., e. g., Ketels/Sölvell 2006). Against this background, the following contribution analyzes what has been achieved so far in terms of cluster and network initiatives in a post-transition economy. The empirical findings concern East Germany, and in particular its south eastern part, in and around the cities of Leipzig, Halle, Dresden and Chemnitz. The findings are based on data gathered in the context of a study which was conducted by the Halle Institute for Economic Research on behalf of the Leipzig Chamber of Industry and Commerce. The general aim of this study was an assessment of the development perspectives of the Leipzig city region in comparison with the neighboring city regions of Halle, Dresden and Chemnitz. Providing a survey on network initiatives was part of the study, and this specific topic was treated by the author.

Analyzing characteristics of cluster and network initiatives requires, first, to gain clarification what is a cluster or a network initiative, in contrast to clusters and networks as such (section 2). Moreover, clarification is required what makes the distinction between a cluster and a network (and between the respective initiatives to foster the one and the other). Then, in section 3, the motivation will be made more explicit, why cluster and network initiatives form a subject of interest particularly in a post-transition economy. Section 4 comprises the empirical findings on characteristics of cluster and network initiatives in the region under consideration. A brief description of the research methodology and the data base (sub-section 4.1) is followed by a characterization of the region under consideration by basic data (sub-section 4.2). The characteristics of cluster and network initiatives identified in the region under consideration are subject of sub-section 4.3. First conclusions derived from the empirical findings will be drawn in section 5.

## 2. Clusters, networks and initiatives to support them – a terminological overview

The cluster concept has become quite popular among policy makers during the 1990ies when M. Porters contributions came up whose subject were the determinants of national or regional competitiveness (cf., e. g., Porter 1990, 1998). Partly in the context of Porters cluster concept, partly beyond, creating and supporting networks has become a wide-spread tool of regional policy, too. Before entering into the empirical details on network and cluster initiatives in the region under consideration, it is necessary to become awareness of the terminology - clusters, networks and, in contrast, cluster initiatives or a network initiatives.<sup>1</sup>

### *Clusters*

When it comes to the *cluster* phenomenon, M. Porter defines it as follows: “A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities.” (ibid. 1998: p. 199). Ketels (2004) – in line with Porter – highlights the following characteristics of clusters: “Proximity”, “Linkages”, “Interactions” and a “Critical Mass” (idem: p. 1). Ketels emphasizes that clusters require an “active” interaction instead of only “being close and working on related issues” (ibid.). Partly, however, clusters are defined in a more passive manner: For instance, the European Commission (EC) defines a regional cluster as “A concentration of ‘interdependent’ firms within the same or adjacent industrial sectors in a small geographical area” (European Commission 2002: p. 14). The constitutive element of the EC’s definition is that it only comprises “interconnected firms”, it explicitly excludes institutions (in the sense of formal institutions). If the latter are included, the EC studies defines this setting as “regional innovation system”. Surprisingly, the question what does “interdependent” (ibid.) or “interconnected” (ibid.) mean remains unanswered within the study cited. Rosenfeld (1997) provides a definition of clusters which tends to be more passive, too: “Clusters are systems in which membership is simply based on interdependence and making a contribution to the functioning of the system.” (idem: p. 9).

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<sup>1</sup> For a brief overview on the terminology of clusters and networks and the commonalities and differences of clusters and networks, cf., e. g., Kiese 2008, pp.56-58.

## *Networks*

Rosenfeld (1997) regards networks as they can be found in various countries as “... collaborative business activities carried out by discrete, usually small, groups of firms in order to generate sales and profits through, for example, joint exporting, production, R&D, product development, or problem solving.” (idem: p. 9). The European Commission defines a “Regional innovation network” as a “More organized co-operation (agreement) between firms, stimulated by trust, norms and conventions, which encourages firm’s innovation activity” (European Commission). If the co-operation includes, apart from that between firms, other organizations for the purpose of “knowledge development and diffusion” (ibid.: 14), the EC classifies it as a “Regional innovation system (ibid.).

Clusters represent a kind of naturally evolved agglomeration phenomena whereas networks represent an instrument of targeted inter-organizational relationships.

## *Cluster and network initiatives*

Apart from clusters and networks as empirical phenomena, the latter have become increasingly a subject of regional policy (cf., e. g., Floeting/Zwicker-Schwarm 2008: 15-40). A broad range of initiatives has evolved in many countries which try to create new or strengthen existing clusters and networks. Hereafter, we call them *cluster and network initiatives*. Stakeholders of cluster and network initiatives may be very different: regional and local authorities, representatives of business and innovation centers as well as semi-public units, for instance the Chambers of Industry and Commerce or the Chambers of Crafts etc. Porter itself regards as a part of a cluster “government or other regulatory bodies that significantly influence participants in the cluster” (Porter 1998: pp. 199 f.). When it comes to cluster and network initiatives, the involvement of governmental bodies, indeed, might be an element of the respective initiative. However, cluster and network initiatives might be more than government bodies being involved in a cluster. The respective initiatives often are targeted at creating clusters and networks in a situation where the economic potential for clustering or networking is still immature.



Moreover, supra-regional governmental bodies often provide subsidy schemes which are targeted at creating or strengthening clusters and inter-firm networks. Such schemes have found a wide-spread use in Germany, especially in the context of support for R&D and networking in the East German enterprise sector. Subsidy schemes targeted at enhancing clustering and networking hereafter are not classified as cluster or network initiatives. But they may induce the establishment of cluster and network initiatives..

In the following chapters the attention is laid on cluster and network initiatives which represent intended actions of various stakeholders to establish or strengthen business to business co-operation or business-to-science cooperation.

### **3. The East German post-transition economy: Why cluster and network initiatives matter**

Policy attempts to create and strengthen clusters und networks can be found worldwide (cf., e. g. Anderssson et al. 2004). Clustering and networking may create the ground for enabling small firms to show a better economic performance as they would show as isolated economic units (cf. Ketels 2004: p. 1). This is of particular importance for post-transition economies. Whereas the centrally planned economy was dominated by large industrial units, a market economy mainly consists of small and medium-sized enterprises. Immediately before the GDR economy collapsed, in 1989, 126 centrally planned industrial trusts (“Kombinate”) existed in the manufacturing sector, and 21 in the construction sector (cf. Statistisches Jahrbuch 1989: 103). In contrast, the small business sector was rudimentary (cf. Ludwig 1994: 93-126). The process of creating an enterprise landscape mainly consisting of small and mediums-sized firms has begun in the eastern part of Germany immediately after implementing the Currency Union (as of July 1<sup>st</sup>, 1990). From this point onward, it became more and more clear, that the formerly centrally planned industrial trusts (“Kombinate”) were not competitive enough under the conditions of a market economy.

The non-competitiveness of this socialist type of firm organization resulted from the principles under which the industrial trusts were formed. First, the idea was to have a limited number of units which can be easily hold under the direction of the central planning authorities. Second, industrial trust organization followed the idea of autarky, i. e. the question “make or by” was mainly answered in favor of “make”. Third, a single industrial trust usually comprised all state owned enterprises which belonged to the same industry, which meant exclusion of each form of competition, and it subsumed enterprises along the value-added chain. Fourth, the economic activities within an individual industrial trust often did not show a spatial concentration. Instead, they were often distributed across a wider territory. To illustrate, the “Kombinat Haushaltgeräte”, an industrial trust producing all kinds of home appliances, consisted of 217 production plants which were located in about 118 of altogether 217 districts (“Kreise” and “Stadtkreise”) of the former GDR (cf. Hornich 1993: 13). Due to the lack of competitiveness, the respective large-scale trusts were not privatizable as entire units. Instead, if any, the various plants, belonging to an industrial trust, were privatized individually. Moreover, even the individual plant often was not privatizable as a whole. The former socialist paradigm of autarky often made the existing plants unattractive for privatization since they comprised enterprise functions which would have existed only separately in a market economy. Therefore, before the privatization took place, in many cases the so called core business was separated from other business activities, i. e. the core business was privatized separately and other former plant sections were split up before. This process of concentrating on the core business when it came to privatization and the parallel split-up-process of other plant sections which were not part of the core business has led to a very fragmented enterprise landscape in East Germany. To illustrate: The centrally planned trusts (inclusive the trusts that belonged to the construction sector and to the geological sector, comprised altogether 2448 plants (cf. Statistisches Betriebsregister der DDR 1990: 381). As of December 1994, when the privatization agency (“Treuhandanstalt”) was closed, 7,853 plants were privatized or transferred into municipal property whereas 3,713 plants had been liquidated or were under liquidation at that time (cf. Grosser 2003, n. p.). Beyond privatization, the business landscape was widened by numerous start-ups as well as by “greenfield” investments conducted by foreign and West German investors.

A particular case of restructuring the East German enterprise sector concerned its research and development activities. When the socialist economy came to an end, the research and development (R&D) units of the state-owned manufacturing sector comprised 86,000 employees (cf. Deutscher Bundestag 1998: 171). In the course of privatization, the R&D units were often closed, since the East German plants became part of a Germany-wide or multinational companies which possess R&D facilities outside East Germany. In numerous cases a very specific solution was found: A split-up of the former R&D units took place – specialized research companies (“Forschungs-GmbH”) were established. The latter were split-up from the former state-owned industrial trusts in order to maintain research competencies. The research companies employed about 12,000 people (cf. Deutscher Bundestag 1998: 162). Currently, about 300 external R&D units and R&D service providers exist in East Germany conducting research for the manufacturing sector (cf. Bundesministerium für Bildung und Forschung 2008: 184). Moreover, Federal and Laender governments have provided considerable financial support for the modernization and establishment of universities and other non-university public research units. The fragmented enterprise landscape and the specific conditions for industrial R&D in East Germany underline the importance of cluster and network initiatives. The latter may help increase the competitiveness and create the bridge between the private enterprise sector and the well elaborated public research sector.

Against this background, numerous cluster- and network policy support schemes provided by the Federal government or by the State (Laender) governments have been introduced in recent years. Against this background, firms, public research entities and local as well as regional authorities have made use of the numerous cluster and network policy schemes (for a brief overview on public support schemes for cluster and network initiatives in Germany, cf. Jappe-Heinze et al. 2008, pp. 6-10). A broad variety of cluster and network initiatives have been established. Many but not all of them have received or still receive public support. The following section provides an overview on cluster and network initiatives and their characteristics which have been established in the south eastern part of Germany, in and around the cities of Dresden, Chemnitz, Leipzig and Halle.

## **4. Characteristics of cluster and network initiatives – the case of Germany’s south eastern region**

### **4.1 Methodology and data base**

The database which creates the ground for analyzing cluster and network initiatives stems from a study which was conducted by the Halle Institute for Economic Research on behalf of the Leipzig Chamber of Industry and Commerce. The aim of the study was to analyze the economic situation in the Leipzig city region in comparison with the neighboring city regions of Dresden, Chemnitz and Halle, and to draw conclusions regarding the future development and options for regional development policy. One of the analytically oriented chapters of the study mentioned concerned the identification of potential agglomeration advantages. The latter included a survey on existing inter-firm networks, too. The respective survey which was conducted by the author of this paper arose as a result of three steps. *First*, various Internet-based information on network initiatives was explored. *Second*, the list of networks gathered by sourcing Web-information was complemented by information gained from an inquiry of the respective Ministries of Economics and Labor Affairs of the States of Saxony and of Saxony-Anhalt, and of economic chambers located in the region. The inquiry had the aim to identify network initiatives which were, for instance, very new or not easy to find by Web-searching. *Third*, for each network initiative gathered within the first two steps, a set of basic characteristics was compiled. The characteristics mainly concern the targets, the sectoral affiliation, the coordination unit and its institutional and regional affiliation, the involvement of public research units and the spatial dimension of the respective network initiative. For the purpose of this paper, the network information gathered was completed by information on the postal addresses of the individual network member firms. This completion allows drawing a more detailed picture on the spatial dimension of network initiatives. The three steps sketched above were conducted at the end of 2007/beginning of 2008.

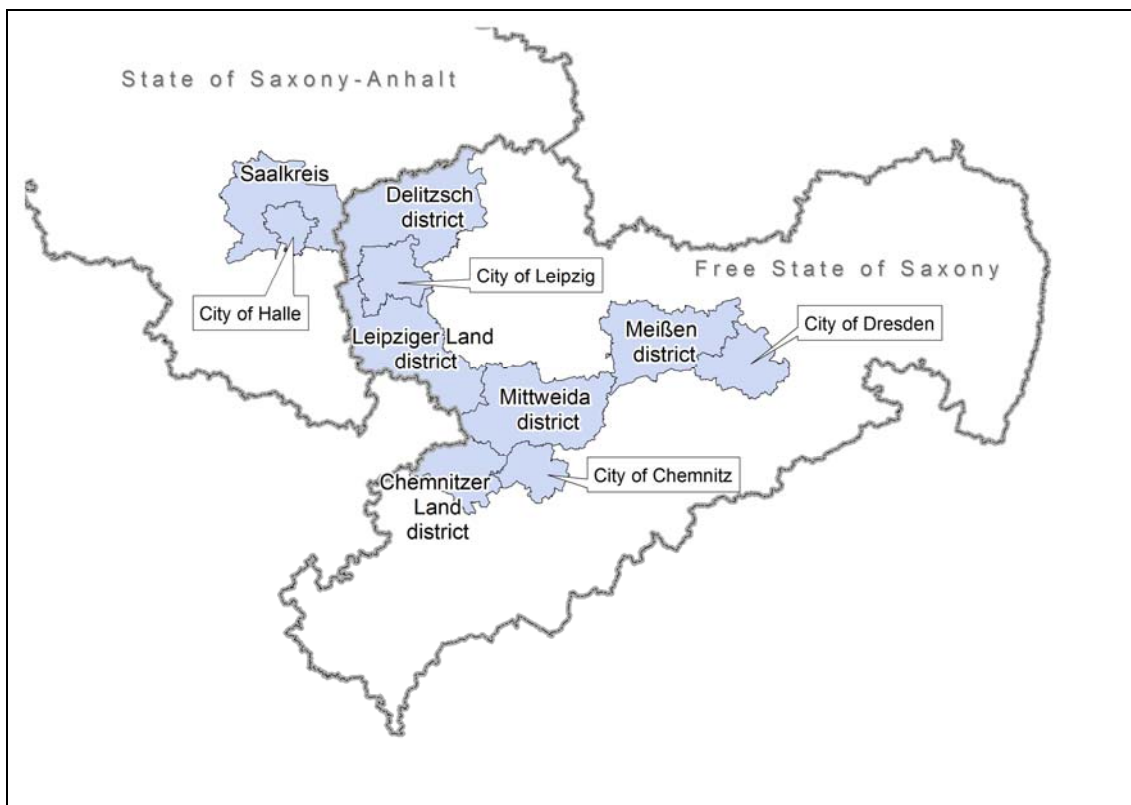


## 4.2 General characteristics of the region under consideration

The investigation of network and cluster initiatives comprises the city regions of Leipzig, Dresden, Chemnitz and Halle (see the map below).<sup>2</sup> City region means the core city itself and the respective surrounding area which forms together with the core city a functional unit in terms of commuting (so called travel to work areas).

Map<sup>3</sup>:

The cities regions of Dresden, Chemnitz, Leipzig and Halle



Source: Mapping by the IWH based on the software ESRI ArcView 9.3.

Hereafter we use the delineation of travel to work areas as they are in use to measure the worthiness to receive financial assistance by German Federal/Laender regional policy grants. Table 1 shows basic characteristics of the four city regions.

<sup>2</sup> The four city regions founded together with the town of Zwickau the so called metropolitan region “Saxon triangle” (cf. Metropolregion Sachsendreieck: no date of publication).

<sup>3</sup> The author wants to express many thanks to Dipl.-Ökonom Michael Barkholz, Halle Institute for Economic Research, Department of Formal Methods and Databases, for producing the map.

Table 1 reveals that the cities of Dresden and Leipzig show a similar population number of about 500,000 inhabitants (as of 2006), the cities of Chemnitz and Halle host a population which is ca. half of the respective numbers in Dresden and Leipzig. Dresden is the only city where a population increase occurred while in Leipzig was a slight and in Chemnitz and Halle a strong population decrease. In terms of firm density in the manufacturing sector, mining and quarrying measured by the number of plants (of enterprises with 20 and more employees) per 10,000 inhabitants, the Chemnitz region does show the largest value, followed by Dresden. The Leipzig and especially the Halle region show a relatively low firm density. Regarding GDP growth, the Dresden region does show the highest growth rate. So far as the employment density in the manufacturing sector, mining and quarrying measured by the number of employees (of enterprises with 20 and more employees) per 10,000 inhabitants is concerned, the spatial pattern shows similarities to that of firm density: The Chemnitz and the Dresden regions show a higher employment density in comparison with the Leipzig and especially with the Halle region.

**Table 1.** Basic characteristics of the city regions of Leipzig, Dresden, Chemnitz and Halle and the respective cities

Region <sup>a</sup>	Population, Rate of Change 1995-2006, %)	Population number 2006 (in 1000 persons)	Number of plants in the manufacturing sector, mining and quarrying (plants of enterprises with 20 and more employees) per 10,000 inhabitants (2006)	GDP, Rate of Change 1995 – 2006, %	Number of employees in the manufacturing sector, mining and quarrying (plants of enterprises with 20 and more employees) per 1,000 inhabitants (2006)
Leipzig city region	-3.1	774.6	4.3	19.2	35.5
City of Leipzig	-3.8	504.8	3.3	24.5	32.3
Dresden city region	0.3	649.8	5.2	43.1	56.7
City of Dresden	0.7	500.5	4.7	49.0	53.2
Chemnitz city region	-11.1	510.2	7.7	23.8	61.0
City of Chemnitz	-15.5	246.1	6.4	14.7	51.4
Halle city region	-11.7 <sup>b</sup>	312.7	3.7	due to an administrative reform no data available	23.5
City of Halle	-17.6	236.6	2.6	28.2	18.8

<sup>a</sup> Delineation of the city regions (travel to work areas): Leipzig: City of Leipzig, Leipziger Land district, Delitzsch district; Dresden: City of Dresden, Meißen district; Chemnitz: City of Chemnitz, Chemnitzer Land district, Mittweida district; Halle: City of Halle, Saalkreis. <sup>b</sup> The comparability of population data between 1995 and 2006 is not completely given since the Saalkreis as a part of the Halle city region shows a slight change of administrative boundaries in the period under consideration.

Source: Calculation by IWH based on data provided by the Federal Statistical Office and by the Statistical Offices of the German Laender.

#### 4.3 Characteristics of cluster and network initiatives

##### 4.3.1 General overview on the number and spatial distribution of cluster and network initiatives

For the purpose of this investigation, a cluster or a network initiative will be recorded as being located in one of the four city regions if the coordination unit/contact person is located in the respective city region. This criterion is, of cause, only a crude measure.

Therefore, subsection 4.3.4 provides a more detailed picture on the territorial dimension of cluster and network initiatives.

Altogether, in the four city regions under investigation – Dresden, Chemnitz, Leipzig and Halle – 111 cluster and network initiatives were recorded (as of end 2007/beginning 2008). The greatest number of cluster and network initiatives shows the city region of Chemnitz (40), followed by Dresden (34) and Leipzig (26). The city region of Halle reveals the lowest number of cluster and network initiatives (11). The ranking in terms of the number of initiatives follows the spatial pattern of firm density in the manufacturing sector shown in sub-section 4.2.

The absolute majority of the respective cluster and network initiatives have its coordination unit in the city itself – a circumstance that results from the location of a large number of public and semi-public administration units as well as universities and research institutes which typically carry out a coordination function for the cluster and network initiatives.

#### 4.3.2 Targets

As a first step of analysis, the targets of the cluster and network initiatives will be analyzed. Information about the targets followed by the individual initiatives allow to gain first insight about the impact intended by the members of the respective cluster and network initiatives, for themselves as well as for the region where the initiative is located. For the purpose of the analysis, ten types of targets were listed, and then the information available on the websites of the individual initiatives were explored regarding information on the targets followed. For each cluster and network initiative, a classification by - at maximum - three sub-targets was conducted.

The findings on targets show that “Supporting research & development and/or innovation” is the most frequently followed target. “Enhancing cooperation and networking” represents the second most important target. “Promoting public relations” stands in three of four regions on the third rank. Regarding the ranking of the three most important targets, there is not a great difference between the four regions under consideration. The dominance of the target “Supporting research & development and/or innovation” may result from the fact that many of the initiatives receive public financial

support which is often linked with the requirement for the recipients to use the funding for common R&D and innovation activities. Moreover, the priority given for R&D and/or innovation in the course of networking activities reveals the special situation in the East German enterprise sector in terms of R&D (see section 3 of this paper): The enterprise sector mainly consists of small and medium-sized enterprises. The circumstance, that enhancing cooperation and networking plays an important role as a target for the initiatives may be interpreted as a sign for the early development stage of numerous cluster and network initiatives. For them, organizing contacts, opening the arena for cooperation may be a value as such. In a similar way, the relatively great importance of public relation activities as a target for cluster and network initiatives could be interpreted.

Contrary, cooperation in the fields of purchase or securing product/service quality play a minor role as targets for cluster and network initiatives. Maybe, if cluster and network initiatives have reached a more advanced stage of activity, such specific targets which contribute to a reduction of costs will create an increasing role.

**Table 2.** Targets of the cluster and network initiatives under consideration (% , total number of targets recorded for the initiatives in the respective city region = 100%, cases without information on targets were excluded)

	<i>City regions of</i>			
	<i>Dresden</i>	<i>Chemnitz</i>	<i>Leipzig</i>	<i>Halle</i>
<i>Categories of targets</i>				
Enhancing cooperation and networking	17.3	24.6	21.3	25.0
Promoting public relations	7.7	11.6	14.9	18.8
Supporting research & development and/or innovation	51.9	40.6	36.2	43.8
Cooperation in the field of production/provision of services	1.9	5.8	6.4	6.3
Enhancing competitiveness of supplier industries	0.0	1.4	4.3	0.0
Securing product/service quality	1.9	0.0	2.1	0.0
Qualification of workforce	7.7	1.4	8.5	0.0
Cooperation in the field of marketing and/or sales and or logistics	1.9	7.2	4.3	0.0
Cooperation in the field of purchase	0.0	1.4	0.0	0.0
Other activities	9.6	5.8	2.1	6.3
Number of initiatives for which no information was available	2	0	0	0

Source: Author's compilation based on the IWH network database 2008.

#### 4.3.3 Industries involved in the cluster and network initiatives

The following sub-section provides an overview on the industrial affiliation of the cluster and network initiatives under consideration. Findings on the industrial affiliation may allow to find some indication whether the respective cluster and network initiatives are backed by a certain regional economic potential in the respective industry. A certain economic potential is regarded as being given, if the region shows an above average specialization in the respective industry.

Based on qualitative information which typically stem from the respective cluster or network initiative's website, each initiative is characterized by – at maximum – four industries. In many cases, the websites contain direct information on the industries involved in the respective cluster or network initiative. Furthermore, member lists which are often published in the respective website provide additional information on the industries involved.

The characterization by industries is based on the German Classification of Economic Activities, Edition 2003 (WZ 2003) (Statistisches Bundesamt 2003).<sup>4</sup> The analysis of industries involved in the cluster and network initiatives comprises the following two steps.

As a *first step of analyses*, an overview will be given about the industries involved in the cluster and network initiatives under consideration. Table 3 shows the industrial affiliation of cluster and network initiatives. The number noted in brackets concerns the number of networks being active in the respective industry. As a second step of analysis, those industries involved in cluster and network industries will be identified which coincide with an above average specialization of the respective industry. Cases where industries involved in network initiatives show a coincidence with an above average specialization of the region under consideration indicate that there is a certain economic potential behind the certain forms of inter-firm cooperation.

Regarding the first step of analyses, the findings are the following: For the city region of Dresden, the networks which have their coordination unit there, altogether comprise economic activities of 26 industries (in brackets: number of networks, where the

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<sup>4</sup> The German Classification of Economic Activities (WZ 2003) is based on the NACE Rev. 1.1 classification.

respective industry is involved). The dominant industries which can be found in cluster and network initiatives in the city region of Dresden are: Manufacture of medical, precision and optical instruments, watches and clocks (16), Manufacture of machinery and equipment n.e.c. (13), Manufacture of radio, television and communication equipment and apparatus (9) and Other business activities (7). The findings for the city region of Chemnitz show that 18 industries are involved in cluster and network initiatives. Two industries show – in terms of number of cases – a particular intensive involvement in cluster and network initiatives: Manufacture of machinery and equipment n.e.c. (20) und the Manufacture of textiles (13). In the city region of Leipzig, altogether, 21 industries are involved in cluster and network initiatives. Industries which are relatively often involved in the initiatives under consideration are: Manufacture of machinery and equipment n.e.c. (7); Manufacture of medical, precision and optical instruments, watches and clocks (4) and Computer and related activities (4).

Cluster and network initiatives which have their coordination unit in the city region of Halle are – in comparison with the other city regions more oriented to the service sector, with few exception concerning activities of Manufacture of rubber and plastic products (4); Manufacture of chemicals and chemical products (4); Manufacture of medical, precision and optical instruments, watches and clocks (3) and Manufacture of machinery and equipment n.e.c. (2).

As already mentioned, within a *second step of analyses*, the question will be answered whether the industries involved in cluster and network initiatives do coincide with an above average specialization of the respective city region in those industries. Specialization is measured by the so called localization coefficient. The latter represents the ratio between the proportion, a certain industry has at the total employment of the region and the proportion, the same industry has at the total employment in the greater territory used as “benchmark”. For the purpose of this investigation, East Germany (including Berlin) represents the “benchmark” for calculating the localization coefficient. As database for the calculation of the localization coefficient, employment data from the Federal Labour Agency were explored.<sup>5</sup> If the analysis reveals such a

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<sup>5</sup> The localization coefficients per industry and city/city region were part of the analyses on the development perspectives of the Leipzig city region in comparison with the neighboring city

coincidence it may be regarded as a first indication that the cluster and network initiatives are backed by a certain economic potential. To provide the respective information about a coincidence between the industries which are involved in network or cluster initiatives and an above average specialization of the city region in the same industry, the cells of the table 3 are gray-colored.

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regions of Halle, Dresden and Chemnitz which was conducted by the IWH on behalf of the Leipzig Chamber of Industry and Commerce.





**Table 3.** Industries which are involved in cluster and network initiatives in the city regions of Dresden, Chemnitz, Leipzig and Halle (in brackets: number of networks, where the respective industry is involved, ray-colored: industries in which the city region shows an above average specialization in comparison with East Germany total)

City regions of			
Dresden	Chemnitz	Leipzig	Halle
Manufacture of medical, precision and optical instruments, watches and clocks (16)	Manufacture of machinery and equipment n.e.c. (20)	Manufacture of machinery and equipment n.e.c. (7)	Other business activities (5)
Manufacture of machinery and equipment n.e.c. (13)	Manufacture of textiles (13)	Other business activities (5)	Manufacture of rubber and plastic products (4)
Manufacture of radio, television and communication equipment and apparatus (9)	Other business activities (8)	Manufacture of medical, precision and optical instruments, watches and clocks (4)	Manufacture of chemicals and chemical products (4)
Other business activities (7)	Manufacture of fabricated metal products, except machinery and equipment (6)	Computer and related activities (4)	Manufacture of medical, precision and optical instruments, watches and clocks (3)
Computer and related activities (6)	Computer and related activities (5)	Manufacture of chemicals and chemical products (3)	Manufacture of machinery and equipment n.e.c. (2)
Manufacture of fabricated metal products, except machinery and equipment (6)	Manufacture of medical, precision and optical instruments, watches and clocks (5)	Manufacture of basic metals (3)	Sewage and refuse disposal, sanitation and similar activities (1)
Manufacture of other non-metallic mineral products (5)	Construction (3)	Manufacture of fabricated metal products, except machinery and equipment (3)	Health and social work (1)
Manufacture of rubber and plastic products (4)	Manufacture of radio, television and communication equipment and apparatus (3)	Manufacture of rubber and plastic products (2)	Education (1)
Manufacture of chemicals and chemical products (4)	Manufacture of office machinery and computers (3)	Manufacture of motor vehicles, trailers and semi-trailers (2)	Research and development (1)
Health and social work (3)	Manufacture of rubber and plastic products (3)	Health and social work (2)	Construction (1)
Manufacture of other transport equipment (2)	Manufacture of electrical machinery and apparatus n.e.c. (2)	Manufacture of textiles (1)	Recycling (1)
Manufacture of basic metals (2)	Manufacture of basic metals (2)	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (1)	Manufacture of radio, television and communication equipment and apparatus (1)
Manufacture of food products and beverages (2)	Manufacture of other non-metallic mineral products (2)	Manufacture of electrical machinery and apparatus n.e.c. (1)	No information on industries involved available(3)
Recreational, cultural and sporting activities (1)	Manufacture of wearing apparel; dressing and dyeing of fur (2)	Manufacture of radio, television and communication equipment and apparatus (1)	
Education (1)	Recreational, cultural and sporting activities (1)	Electricity, gas, steam and hot water supply (1)	
Research and development (1)	Education (1)	Collection, purification and distribution of water (1)	
Post and telecommunications (1)	Post and telecommunications (1)	Construction (1)	
Air transport (1)	Manufacture of motor vehicles, trailers and semi-trailers (1)	Supporting and auxiliary transport activities; activities of travel agencies (1)	
Hotels and restaurants (1)	No information on industries involved available (2)	Public administration and defence; compulsory social security (1)	



**Table 3** (continuation)

City regions of			
Dresden	Chemnitz	Leipzig	Halle
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods (1)		Education (1)	
Manufacture of motor vehicles, trailers and semi-trailers (1)		Recreational, cultural and sporting activities (1)	
Manufacture of electrical machinery and apparatus n.e.c. (1)			
Manufacture of office machinery and computers (1)			
Manufacture of pulp, paper and paper products (1)			
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (1)			
Manufacture of textiles (1)			
No information on industries involved available (3)			

Source: Author's compilation based on the IWH network database 2008 and on localization coefficients being part of the analyses of the development perspectives of the Leipzig city region in comparison with the neighboring city regions of Halle, Dresden and Chemnitz which was conducted by the Halle Institute for Economic Research on behalf of the Leipzig Chamber of Industry and Commerce (see footnote 3).

In Dresden, 13 of altogether 26 industries (listed in table 3) which are involved in cluster and network initiatives represent industries in which the city region of Dresden shows an above average specialization. In Chemnitz, 12 of 18 industries coincide with an above average specialization. In the Leipzig region a coincidence between an industries' involvement and a cluster initiative is given in 8 out of 21 industries, in the Halle city region this is true for four out of 12 regions.

To draw an *interim conclusion*: Whereas in the Dresden 50% and in the Chemnitz region 2/3 of the industries involved in cluster and network initiatives represent industries in which the region is specialized above average in comparison with East Germany total. In contrast, in Leipzig and Halle, cases of coincidence are rather poor. In comparison with Chemnitz and Dresden, the two regions reveal a lower firm density in and employment density in the manufacturing sector.

Counting cases of coincidence or non-coincidence between industries involved in cluster and network initiatives and regional specialization patterns, however, needs to be relativized. The analysis, presented, is based on the “conventional” statistical classification of economic activities. The classification of economic activities has found a widespread use for the purpose of empirical investigation. However it faces the problem that “new” economic activities, for instance in the fields of biotechnology/life science, nanotechnology, renewable energies etc. will not be displayed in an adequate way by the conventional statistical classification. Therefore, further in-depth analysis for the cluster and network initiatives will be necessary, accompanied by a more detailed measurement of regional specialization patterns which tries to consider such new economic activities.

#### 4.3.4 Territorial coverage<sup>6</sup>

The territorial coverage of cluster and network initiatives is, doubtless, an important characteristic. The question can be raised, whether the respective initiative is a pure local one, or whether it does comprise firms and research entities located in a wider territory or even abroad? Nevertheless, the interpretation of findings on the territorial dimension of cluster and network initiatives remains ambivalent. Network initiatives which show a very limited territorial scale might be regarded as being particularly suitable for enhancing intensive knowledge flows. Spatial proximity of member firms creates possibilities for more face to face contacts compared with networks which have a wider territorial scale. Intensive face to face contacts prepare the ground for an easy flow of tacit knowledge. Nevertheless, a strong local focus of cluster and network initiatives might lead to negative consequences, too. For instance, a strong local orientation might create lock-in-effects.

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<sup>6</sup> The author thanks Ms. Stephanie Hengstwerth, student of economics at the Dresden University of Technology (TU Dresden), who conducted an internship at the Halle Institute for Economic Research in 2009. She updated the information on the territorial dimension of the cluster and network initiatives in the four regions under investigation.

Lock-in-effects means, that openness for new ideas and new solution remains very limited, since local stakeholders are embedded in “old routines”. In contrast, cluster and network initiatives which include partners from different territories, maybe from, abroad, can benefit from innovative ideas stemming from outward partners.

The empirical findings reveal a large proportion of interregionally-oriented initiatives (see table 4). In each city region under consideration more than 50% of the cluster and network initiatives for which information on their territorial dimension was available show an interregional orientation. Interregional orientation does mean that the respective initiatives do not only have member firms in the State (Land) where the management/coordination unit is located. They have at least one partner in another German State, too.

One reason for the large proportion of interregionally-oriented cluster and network initiatives might result from the circumstance that various cluster and network initiatives have been brought up by the “Industrial Initiative for Central Germany” (“Wirtschaftsinitiative für Mitteldeutschland”)<sup>7</sup> which has its coordination unit in the city of Leipzig. One of its main aims is to organize clustering and networking initiatives which comprise firms and research units from the three south eastern German States – Saxony, Saxony-Anhalt and Thuringia. Another reason for the relatively large proportion of cluster and network initiatives which show an interregional orientation might result from the fact that individual industries, at least in some cases, suffer from a low number of potential partners in the respective region. If the latter is the case, cluster and network initiatives have to seek for partners located in a greater spatial distance.

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<sup>7</sup> See <http://www.mitteldeutschland.com/>, accessed on 23/04/2009.

**Table 4.** Territorial dimension of cluster and network initiatives located in the City regions of Dresden, Chemnitz, Leipzig and Halle (share of cluster and network initiatives (% , number of networks for which information on the territorial dimension was available = 100%)

	<i>City regions of</i>			
	<i>Dresden</i>	<i>Chemnitz</i>	<i>Leipzig</i>	<i>Halle</i>
<i>Categories of territorial dimension</i>				
Regional (only in the State (Land) where the coordination unit has its location	31,3	36,8	41,7	36,4
Interregional (at least one partner outside the state (Land) where the coordination unit has its location	56,3	55,3	54,2	63,6
International (at least one partner outside Germany <sup>9</sup>	12,5	7,9	4,2	0,0
Number of cluster and network initiatives for which no information is available on their territorial dimension	2	1	2	0

Source: Author's compilation based on the IWH network database 2008.

#### 4.3.5 Inclusion of public research units

Public research units often play an important role as nodes for the transfer of knowledge within cluster and network initiatives. Moreover, they generate new knowledge, and gather knowledge existing worldwide and provide both for firms existing in the region where the public research unit is located (cf. e. g., Fritsch 2007). Therefore, public research units may act as important drivers within cluster and network initiatives, too. This role is of particular importance for the East German post-transition economy where research and development in the private business sector shows until now certain deficits which have to do with the size structure of the enterprises characterized by a dominance of small and medium-sized enterprises and a lack of large enterprises (see section 3 of this paper). Contrary, public research units play an important role in research and development. To bring firms and public research units together, cluster and network initiative should offer appropriate conditions.

For the purpose of the investigation presented here an inclusion of public research units is regarded as being given if at least one university or university of applied science ("Fachhochschule") or at least one non-university research institute belongs to the respective cluster or network initiative. As non-university research institutes are counted the institutes belonging to the four academic societies in Germany: the Leibniz, Max

Planck, Fraunhofer and Helmholtz Societies. The information about the inclusion of public research units as defined above stem from the exploration of the websites of the individual cluster and network initiatives. With few exception, the majority of initiatives under investigation provide member surveys at their website which comprise public research units, too.

Table 5 provides an overview about the occurrence of inclusion of public research units. In all city regions the proportion of cluster and network initiatives in which at least one public research unit is included exceeds the 75% margin (total number of initiatives for which information on individual members were available = 100%). The relatively large proportion of cluster and network initiatives which include at least one public research units is corresponding with the findings presented above on the targets the initiatives have set up (see sub-section 4.3.2). It was shown that the target “Supporting research & development and/or innovation” represents the most important target for the cluster and network initiatives under consideration. The large proportion of inclusion of public research units may result, similar to the importance of the R&D target, from the circumstance that many initiatives under investigation received or still receive public financial support from cluster and network support schemes offered by the Federal government or by the State (Laender) government.

The research units which belong to cluster or network initiatives are not necessarily located in the same city region as the coordination unit and the majority of member firms do. To provide an example, the city region of Leipzig hosts a network of firms belonging to the foundry industry (Gießereinetzwerk Leipzig e. V.).<sup>8</sup>

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<sup>8</sup> Cf. <http://www.gienet.de/>, accessed on 23/04/2009.



**Table 5:** Inclusion of public research units in cluster and network initiatives located in the city regions of Dresden, Chemnitz, Leipzig and Halle (share of cluster and network initiatives (% , number of networks for which information on the involvement of a public research unit was available = 100%)

	City regions of			
	Dresden	Chemnitz	Leipzig	Halle
<i>Inclusion of a public research unit (university, public research institute outside a university in the respective cluster or network initiative</i>				
Yes	93.5	77.1	87.5	81.8
No	6.5	22.9	12.5	18.2
Number of cluster and network initiatives for which no information on individual members was available	3	5	2	0

Source: Author's compilation based on the IWH network database 2008.

However, there is no technical university in the city region. Against this background, a specific academic unit (“Verein Fachschaft Freiburger Gießerei e. V.”) which belongs to the technical university of Freiberg (100 km distant from Leipzig)<sup>9</sup> is a member of the Leipzig casting industry network.

## 5. Conclusions

The findings reveal that in the regions under consideration numerous cluster and network initiatives exist. Certain characteristics look similar if one compares the four city regions. The similarities concern the targets which show a particularly great proportion of R&D- or innovation-oriented initiatives, and they concern the inclusion of public research units. Maybe, these similarities partly result from the particularities of the post-transition economy in East Germany, where a great need for inter-firm cooperation and for transfer of R&D results from public research units to small and medium-sized firms exists. Partly, these similarities might be caused by the rules of various subsidy schemes targeted at enhancing collaborative R&D and innovation.

However, the analysis reveals differences regarding cluster and network initiatives in the four city regions, too: First, the number of cluster and network initiatives in

<sup>9</sup> Cf. [http://www.gupf.tu-freiberg.de/freiberg/fg\\_verkehr.html](http://www.gupf.tu-freiberg.de/freiberg/fg_verkehr.html), accessed on 23/04/2009.

Chemnitz and Dresden is greater than that in Leipzig and Halle. These findings go along with the circumstance that the manufacturing sector in terms of firm density and employment density is less developed in Leipzig and especially in Halle in comparison with Chemnitz and Dresden. Second, the cases of coincidence between industries involved in cluster and network initiatives and the circumstances that the respective region does show an above average specialization in those industries are more often given in the Chemnitz and Dresden region in comparison with the Leipzig and Halle region. Maybe, in Leipzig and Halle network activities try to compensate for the low density of activities in the manufacturing sector, whereas in Dresden and Chemnitz cluster and network initiatives are designated mainly to “strengthen existing strengths”.

However, to draw implications regarding regional policy, further research will be required. The analyses of coincidence between industries which are involved in cluster and network initiatives and the patterns of specialization should be deepened, especially with respect to cluster and network initiatives which concern “new” industries which go across traditional classifications of economic activity. Another field of further research concerns the locations of the firms which belong to the individual initiatives. In-depth findings on the territorial spread of member firms could provide additional insights in which regions and industries face-to-face contacts may occur easier and in which regions and industries their occurrence will be more difficult.

However, one policy implication seems to be quite obvious: The four regions are relatively close to each other, partly there are common specialization patterns. Against this background, cluster and network initiatives which bring together firms and research units from all four city regions, could make sense. This would correspond to the vision of the metropolitan region “Saxon triangle”, too.

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