Business Clusters

PROMOTING ENTERPRISE IN CENTRAL AND EASTERN EUROPE



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Foreword

I am very pleased to introduce this new publication from the OECD LEED Programme. It tackles a subject of great importance to economic development in Central, East and South East Europe. The cluster mapping, analysis of existing cluster policies and recommendations for policy development presented in this book are intended to support policy-makers, entrepreneurs and other decision-makers working in these economies and beyond. They show how the cluster concept can be operationalised to support small firm growth and employment creation at local level.

This publication aims to inform national, regional and local policy makers in Central, East and South East European countries about policies to develop business clusters (local concentrations of horizontally or vertically linked firms that specialise in related lines of business together with supporting organisations). In addition, it aims to share cluster experiences from Central and Eastern Europe with other OECD member and non-member countries.

Since its founding in 1982, the OECD Local Economic and Employment Development (LEED) Programme has played a critical role in identifying and disseminating information on international innovations and best practices in local economic and employment development. LEED quickly grasped the importance of clusters and inter-firm networks for entrepreneurship and employment creation. Over the years, it has organised many conferences and studies on the subject with the aim of alerting entrepreneurs, governments and development agencies to the potential of the cluster concept and informing policy makers on the most appropriate forms of intervention.

The LEED Programme has also been active for many years in the promotion of entrepreneurship and small and medium-sized enterprise (SME) development in Central and Eastern Europe. An important step was taken to reinforce this work in 2003 with the creation of the OECD LEED Trento Centre for Local Development, which provides a structure for policy analysis, information exchange and capacity building activities to promote entrepreneurship, local governance and social cohesion with a special focus on Central, East and South East European countries.

This book forms part of LEED's ongoing work on clusters and on entrepreneurship promotion in the OECD LEED Trento Centre target countries. It is the fruit of a joint project with the Central European Initiative/European Bank for Reconstruction and Development called "Clusters in Transition Economies". In addition to detailed analytical work, the project involved five cluster conferences in Czech Republic, Hungary, Poland, Slovakia and Slovenia 8in 2001-2002 and the major "East-West Cluster Conference" that took place in Udine and Grado, Italy, in October 2002.

The major contribution of the book is a first cluster mapping exercise in five case study countries, which identifies and describes the existing and emerging clusters in each country. In addition, the book describes the policies in place in aech country to promote cluster development and makes recommendations on how cluster development can be better supported by policy. The final section of the book draws out policy recommendations relevant to all Central, East and South East European countries in three thematic areas: cluster strategy, programme design and cluster management.

With this book, the newly established OECD Centre for Entrepreneurship, SMEs and Local Development, of which the LEED Programme is a part along with the Working Party on SMEs and Entrepreneurship and the Tourism Committee, provides practical insights on clusters and cluster policies to governments, local development practitioners and entrepreneurs alike who want to use the cluster concept to pursue a wide range of economic development-related goals.

The Central, East and South East Europe region has been through much change in recent years. It is now time to move beyond the free market transition to establish solid foundations for sustainable economic growth. There is still much work to do and solid analysis and forums for the exchange of ideas are needed to support future policy development. The OECD Centre for Entrepreneurship, SMEs and Local Development, and in particular its OECD LEED Trento Centre, will be closely involved in this process in the coming years.



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Executive Summary

"Clusters" – local concentrations of horizontally or vertically linked firms that specialise in related lines of business together with supporting organisations.

Since the publication in 1990 of Michael Porter's book, "*The Competitive Advantage of Nations*" (Macmillan, London), clusters have grasped the imagination of both policy makers and entrepreneurs. In a globalising world where small and medium-sized firms increasingly have to compete internationally, clusters play an important role in supporting firm competitiveness by increasing productivity, innovation and firm formation.

Due to the benefits associated with a range of agglomeration economies, clusters have attracted the interest of policy makers wanting to boost innovation in industrial growth sectors such as biotechnology and telecommunications, as well as to support local economic development in disadvantaged localities and regions. Governments in central, eastern and south east Europe have realised that in order to achieve sustainable economic growth and to foster regionally balanced economic development, it is crucial to encourage entrepreneurial spirit at the local level. Clusters, demanding interaction among entrepreneurs and local institutions, co-operation of both local and federal levels of government, as well as co-ordination among various policy areas have the potential to dynamise their local economies. As a result, cluster policies and initiatives have proliferated in recent years. Do clusters only occur spontaneously or can they be formally encouraged? What role do the public authorities play? Which policies work best? These are just some of the questions hotly debated.

Today, countries that have successfully made the transition from socialist economic systems to market economies more than a decade ago seemingly face the same challenges as other OECD countries, namely to increase the international competitiveness of their economies. Strong regional disparities due to an over-reliance on traditional industry and agriculture that lacks international competitiveness; regional disparities due to an uneven distribution of foreign direct investment; power asymmetries in

relationships between small firms and international investors; the necessity to embed foreign direct investment and related issues of skills formation. These issues are all too familiar to advanced capitalist economies. In the case of countries having recently undergone political and economic transformation, they are compounded by their intensity and simultaneity. Aggravating the situation is a lack of social capital which seems to be characteristic of many post-communist economies. On the policy side, pressures deriving from the sheer speed of change and the interdependence of reforms carried out simultaneously make themselves felt. An important related issue here is the lack of qualified development practitioners trained in interdisciplinary thinking both inside and outside ministries.

The focus

This publication gives an overview of enterprise agglomeration in **Slovenia**, **Slovakia**, **Poland**, **Hungary** and the **Czech Republic,** assessing its local, national and international dimensions in terms of boundaries, impacts and linkages. In the first part, theoretical background is provided, framing the cluster concept and addressing methodology questions in the first chapter. In the second chapter, special attention is paid to the concept of social capital, a crucial element in cluster formation and upkeep, especially in post-communist settings.

The second part of the publication is dedicated to individual country case studies of Slovenia, Slovakia, Poland, Hungary and the Czech Republic, presenting cluster evidence at local and regional level including evidence on links with the international economy, as well as the underpinning country policy framework. The five case studies present a snapshot of the cluster phenomenon in central Europe and provide insights on trends in economic development with the aim of informing economic and industrial policy making. In addition, the publication aims at spreading innovative cluster practices developed and implemented in central, eastern and south east Europe.

Slovenia

(i) Existing clusters

Slovenia's approach of "dynamic concentric circles" encouraging clustering of SMEs around a lead company, mostly large in size, had fostered eleven institutionalised clusters encompassing 700 companies working on more than 150 joint projects in areas such as marketing, production, R&D and internationalisation in 2003.

(ii) Cluster policy

Slovenia became interested in clusters towards the end of the 1990s while trying to grapple with the significant lag in productivity of Slovenian industry compared with the EU average. In contrast to the other four countries researched, Slovenia decided to integrate the concept of clusters systematically in a comprehensive approach to serve long-term economic policy goals. It anchored clusters at the heart of a pro-active industrial policy aiming at SME support and the upgrading of productivity levels and innovation potential of Slovenian industry dedicating significant resources both in money and in attention paid to the process.

(iii) Areas for improvement

While knowledge about the benefits of the cluster concept has been carried into the economic arena, making clusters work by overcoming lack of trust among big and small firms remains an issue.

(iv) Lessons for other countries

The Slovenian cluster chapter provides key insights into how Slovenian economic policy is shaped, particularly with regard to clusters spanning the period of 1999 to 2006. It gives a step-by-step description of the Slovenian cluster mapping exercise which served as a basis for devising Slovenian cluster policy. It then delves into the intricacies of promoting clusters, describing the incremental process of cluster building.

Slovakia

(i) Existing clusters

The aim of the Slovak cluster study was to investigate the locational and clustering behaviour of foreign and domestic firms by both quantitative and qualitative means identifying 46 "spatial concentrations" identified by location quotients.

(ii) Cluster policy

Since the early 1990s, small and medium-sized enterprise (SME) support has been established as a priority at all levels of governance. However, despite recommendations by international agencies including the United Nations Industrial Developent Office, the Organisation for Economic Co-operation and Development and the European Commission, no cluster approach is used in Slovakia either at the policy analysis or at the policy development level. Certain parallels to the cluster approach can be found in the policies pertaining to the Slovak automotive industry and to industrial

parks, although these developments seem to be driven mainly by the influx of foreign direct investment (FDI) and employment policy concerns.

(iii) Areas for improvement

A cluster orientation highlights the fact that different policy areas directly influence national competitiveness, a fact often neglected, especially among government circles. It is recommended that Slovakia takes advantage of this policy tool to inform its regional development policy planning.

(iv) Lessons for other countries

Clusters provide a way of organising thinking about inter-related policy areas helping to co-ordinate and guide policies in science and technology, education and training and export and foreign investment promotion, among others.

Poland

(i) Existing clusters

Polish clusters in traditional and high-tech branches have a strong regional element, with spontaneous bottom-up networking in evidence since economic transformation. Emerging regional innovation systems show a strong similarity to clusters, especially in high-technology sectors.

(ii) Cluster policy

The concept of clusters as a policy tool is a brand new in Poland, with growing interest in networking observable specifically in terms of innovation policy. At the beginning of the 1990s, self-governed communes started to operate at the local level, with regional development managed by self-governed regions following a decentralisation reform in 1999. Throughout Poland, regional innovation strategies are being carried out as an important ingredient of regional development strategies.

(iii) Areas for improvement

Cluster mapping and the regional studies presented show that there is strong potential for the development of competitive cluster structures in Poland. However, an overview of policy and institutions supporting small and medium-sized enterprises reveals that so far, no specific measures to foster clusters have been undertaken.

(iv) Lessons for other countries

A model for policies conducive to cluster development would be the offer of the Polish Agency for Enterprise Development to provide financial assistance to consortia of SMEs in public procurement as well as grants for the consolidation or joint-ventures, setting up groups of producers or supply/trading networks for the creation of joint marketing.

Hungary

(i) Existing clusters

Hungary has successfully mastered economic transition benefiting from its geographic location and attracting the lion's share of foreign direct investment in central and eastern Europe. Over the last years, Hungary has seen the emergence of clusters in several of its industries, ranging from the automotive sector, logistics, construction and tourism. The investment-based, export-orientated machinery and automotive industry (for example the Pannon Automotive Cluster, PANAC, representing 10% of GDP) has been the frontrunner in this development.

(ii) Cluster policy

Under the Ministry of Economy's Szechenyi plan in 2000, 21 consortia of firms have been officially recognised as clusters receiving state support. A first analysis reveals however that only a third of all recognised clusters can be backed up by statistical evidence.

(iii) Areas for improvement

Large multinational firms play a very significant role in the Hungarian economy, accounting for the overwhelming proportion of the nation's GDP, exports and research and development activity. However, growth has been concentrated in the western parts of the country and there is a widening east-west economic divide. Cluster-building has been largely foreign investment-driven, with home-grown clusters slowly emerging.

(iv) Lessons for other countries

The recent economic slowdown has exposed Hungary's over-dependence on FDI, further emphasising the need for alternative strategies of economic and regional development, such as the Pannon Economic Initiative. The Pannon Economic Initiative (PGK) founded in 2001 strives to establish a co-operative partnership between regional and economic development organisations to increasingly involve both private funds and assistance from international financial institutions in regional development.

It provides a joint regional platform for the automotive, wood, electronics, thermal and fruit clusters creating the framework for network-based economic development in Western Transdanubia, thus extending the scope of enterprises contributing to the economic dynamism of the region.

Czech Republic

(i) Existing clusters

The phenomenon of clustering in the Czech Republic encompasses both firm concentrations localised in old industrial areas (such as in metallurgy and engineering, like in Moravia), as well as country-wide supplier networks for large international firms such as Volkswagen/ Skoda. At the same time, SMEs are starting to cluster together following a bottom-up approach in an effort to withstand the asymmetric power relations in supplier-networks, be it faced with transnational supermarket chains or the automotive industry.

(ii) Cluster policy

While the cluster concept is still relatively new in the Czech Republic, a lot of governmental programmes are targetting entrepeneurial co-operation and SME development in general. The Society of Technology Parks, the counselling agency Czech Venture Partners and the Czech Innovation Centre among others provide general support for enterprises. The Czech Agency for Foreign Investments (Czechinvest) stands out as an important actor in FDI-driven cluster development co-ordinating the foundation of industrial zones and searching for strategic investors.

(iii) Areas for improvement

There seems to be strong potential for cross-border co-operation that would benefit from support: The authors expect the emergence of a supranational automotive multicluster in central Europe with its core in the northeastern part of the Czech Republic within reach of Poland, Slovakia and Hungary.

(iv) Lessons for other countries

Since 2000, the Czech Ministry of Industry and Trade has been disbursing funds aimed at fostering inter-firm co-operation in conjunction with the Czech-Moravian Bank of Guaranty and Development. In April 2003, 58 applications of firms had been positively reviewed and a total amount of contribution 213 million CZK (approximately 6.5 million EUR) paid.

Policy recommendations

Over the last twenty years, a great body of academic research, as well as practical experience regarding clusters has been constituted. Below, overall policy recommendations deriving both from past and present cluster study and experience, as well as from the five countries regarding cluster strategy, cluster programme design and cluster management will be presented.

The five case studies reviewing cluster experiences from Slovenia, Slovakia, Poland, Hungary and Czech Republic review various policy tools and initiatives to foster cluster development directly or indirectly. Some good practices, such as Slovenia's top-down/ bottom-up approach forming both inter-ministerial and inter-firm networks, Hungary's Pannon Growth initiative offering an integrated concept of regional development, the Czech co-operative cluster model and the Polish regional-based innovation approach stand out. Analysis of case studies countries confirms the relevance of already identified general policy recommendations regarding cluster formation and upkeep.

While most policy recommendations are valid for all countries, this publication aims to encourage further study regarding the merit of measures specifically targeting clusters in countries having recently undergone political and economic transformation and therefore has a particular focus on recommendations for countries in central, east and south east Europe.

Cluster Strategy

- **Utilise cluster mapping to identify local and regional competitive advantage:** Clusters are a useful tool to benchmark industries and identify trends to inform industrial policy making.

- **Encourage clusters to help upgrade firm competitiveness and innovation:** Cluster participants are better prepared to cope with the pressures associated with international competition thanks to pooling of key resources and processes of collective learning and rivalry that support more rapid process and product innovation.

- **Integrate the cluster approach into regional and local development policy design and implementation:** Regional development policy needs to strengthen the regional institutional system for the efficient use of European Union funds and the implementation of independent regional programmes tailored to local needs. The cluster concept is a useful one in encouraging local and regional capacity building.

- **Use clusters to encourage local development and to strengthen SMEs:** Fostering clusters can be used to achieve a wide range of local development goals, such as SME support, job creation and skills upgrading that are important locally and translate into welfare gains at the regional and national levels.

- **Integrate the cluster concept into national strategies for attracting and embedding foreign direct investment:** Countries such as Sweden and Finland have been successful in attracting investment based on a strategy of promoting and developing cluster competencies in specific industrial sectors. By identifying and building on local competitive advantage, central and eastern European countries can successfully embed FDI.

Cluster Programme Design

- **Grasp the importance of sustainability:** Cluster policies need to be designed with a long time horizon in mind.

- **Favour a hands-off approach strictly limiting state intervention:** Support should be based on clear criteria conditional upon bottom-up entrepreneur-led initiatives with a proven potential for self-sustainability.

- **Build public-private partnerships to develop a constructive dialogue to identify local development needs:** Networking of local stakeholders is crucial to moving forward localities economically and socially. Exchanges between entrepreneurs, civil society and public authorities can help to dynamise local economies.

- **Integrate the concept of social capital:** Special attention needs to be paid to building social capital among cluster participants, earmarking resources for this task in the programme design.

- **Foster inter-ministerial co-operation to form "policy clusters":** Policies to advance regional development, to strengthen SMEs and to increase innovation need to be carefully co-ordinated to achieve synergies. Forming inter-ministerial groups taking into account the multiple facets of clusters will help to achieve these goals.

- **Encourage evaluation:** Policies and programmes in place need to be continuously monitored and evaluated. Cluster mapping needs to be undertaken on a regular basis as an instrument to benchmark industries/ sectors and to identify industry trends.

Cluster Management

- **Build up a critical mass of information, knowledge, skills and technology** to allow groups of companies to seize new organisational models and technologies as viable business opportunities.

- **Invest in network management and social capital building** through the training of network mediators and the selection of cluster managers, among other things.

- **Increase productivity** through joint communication and information links, specific education and training programmes and local supply chains.

- **Increase innovation** through joint research and development and outsourcing of research and development.

- **Enhance openness** by enabling new members to bring in new knowledge, resources, technology and experience and by encouraging linkages with international network structures.

Part I

THEORETICAL BACKGROUND

Chapter 1

Clusters: Definition and Methodology

by Johanna Möhring

Local productive systems, industrial districts or clusters describe the tendency of firms in related lines of business and their supporting organisations to concentrate geographically. By clustering together, firms can achieve economies of scale and scope and lower their transaction costs. Various cluster types exist depending on their firm composition, industry sector, cluster raison-d'être and organisation. Recently, the cluster concept has attracted criticism drawing attention to the oft-neglected limitations of the cluster concept and consequently, cluster policies. The importance of clustering in the post-communist context is outlined, as well as cluster research methods and the methodology of the current publication.

Clusters and their benefits

"Clustering" refers to local concentrations of horizontally or vertically linked firms that specialise in related lines of business together with supporting organisations, though definitions as to what exactly constitutes a cluster vary greatly. In this publication, concepts such as industrial districts, local production systems and regional clusters of innovation are used interchangeably and are commonly referred to as clusters for the sake of simplification. Even though above concepts highlight or emphasise slightly different cluster aspects, their main theoretical building blocks, namely agglomeration economies, endogenous development theory and systems of innovation overlap (Moulaert and Sekia, 2003).

Clusters allow enterprises to thrive under conditions of increasingly global competition. By clustering together, firms can achieve economies of scale and scope and lower their transaction costs due to geographical proximity and increased interaction often based on trust. Industry concentrations can lead to the appearance of localisation economies reducing costs through the availability of specialised labour and business services, public sector investments aimed at satisfying particular industry needs, as well as financial markets geared towards satisfying cluster firms' demands. Clusters have also been identified as motors for innovation, as companies co-operating and competing at close geographic proximity can learn from each other, developing unique local knowledge and creating knowledge spill-overs in the process. The introduction of new technologies is favoured both by the element of competition, as well as by the possibility

of cost-sharing among cluster participants. Competitive advantage commonly associated with clusters does not limit itself to firms participating in a cluster it also benefits the whole regional economy where a cluster is located.

Clusters are an international phenomenon that exists in a multitude of shapes and sizes. A cluster can contain a small or large number of enterprises, as well as small and large firms in different ratios. Clusters can consist exclusively of firms operating in the same line of business or include whole supply and value chains. Clusters vary widely regarding the number of participants and their degree of organisation. For example, they generally contain firms that compete against each other, although co-operation may be achieved on a case-by-case basis. In some cases, inter-firm networking leads to the creation of strong horizontal bonds among firms supported by social institutions, whereas in others, vertical links with very little interaction and no cluster organisational sub-structure may prevail. How far a cluster may geographically expand is a topic of debate. Depending on the individual cluster logic, a cluster may be firmly rooted in a local context or indeed span a whole country with cross-border or international links. Clustering occurs in all branches of industry, be it high-tech or traditional industries, as well as in agriculture or in the service sector with each cluster being a unique constellation in time and space.

Among others, clusters occur due to proximity to markets, the presence of specialised labour, the availability of infrastructure, as well as other inputs such as natural resources, information, etc. and equipment/service suppliers.

Cluster typologies

Empirical evidence has shown that even though common cluster characteristics can be identified, clusters around the world greatly differ in composition, shape and inherent cluster logic. In an effort to improve analytical measuring of clusters, as well to develop targeted cluster strategies, an attempt has to be made at working out a classification of the most common cluster types. The starting point of Markusen's typology of industrial districts (Markusen, 1996) was that literature had failed thus far to explain why certain localities were able to attract and lock in investments and industry under increasing capital mobility while others seemed not. She found that the role of governmental actors at national and regional levels, as well as the role of large multinational firms had been underestimated in the formation of industrial districts. In addition to the Marshallian concept of the "New Industrial District" with flexible specialisation that had failed to explain economic success and failure of a number of firms around the world,

Markusen identified the "Hub and Spoke District", the "Satellite Industrial Platform" and the "State-centered District". "Hub and Spoke" describes a region's economic activity revolving around one or several major corporations in one or several industries. In the "Satellite Industrial Platform" model, daughter firms of multinationals produce either high- or low-tech goods receiving some sort of public subsidy. Lastly, the "State-Centered District" describes regional economic activity linked to government investment in the widest sense. Markusen also states that in real life, several types of clusters may co-exist and a district may shift its composition over time.

Porter's approach to measuring regional competitiveness (Porter, 2003) differentiates between resource-dependent, local and traded industry. Resource-dependent industries operate on natural resources like coal and wood, but also on resources in terms of location, such as operation of shipping channels or similar. Local industry caters to purely local needs, whereas traded industry is not bound to its locality in its reach. In his findings, Porter identifies traded industry as the most competitive part of individual regional industry make-up.

Enright (2000) proposes a cluster classification according to cluster development stages differentiating between working clusters, latent clusters, potential clusters, policy-driven clusters and wishful-thinking clusters. This typology reveals that different stages of cluster development require indivually tailored policies.

Summing up, several cluster types can be assessed today depending on their inherent cluster logic and their cluster base and potential policy answers.

Cluster theory

The history of the cluster concept mirrors the efforts over the last twenty years by economists, geographers and planners alike to develop a new model of regional development in industrialised economies. This new model was to explain economic growth and innovation in some regions while providing a potential policy tool to combat structural economic weakness in less favoured ones. At the backdrop of this development was a crisis in traditional industrial policy that mainly relied on subsidies to foster national industry that started in the 1970s. Faced with declining industries and dwindling resources to prop them up, advocates for local and regional approaches to economic development became ever more vocal demanding a rethink of national-state led regional economic policy (Moulaert and Sekia, 2003).[1]

In an effort to break new theoretical ground to explain and inform regional development, researchers could build on approaches of industrial economics. The work on industrial districts has its roots in the work of Marshall (Marshall, 1919 and 1929). Industrial districts (Bagnasco, 1977) refer to agglomerations of geographically localised firms that develop and keep up strong social bonds of trust and reciprocity over time that are conducive to specialisation and innovation. Institutions such as artisan associations and chambers of commerce, as well as networks among entrepreneurs form the backbone of industrial districts allowing for both co-operation (for example, participating in credit-guarantee schemes open to district members) and competition to co-exist among actors. Industrial districts are able to harvest both local economic and social forces in an effort to negotiate ever present industrial change while keeping up a specific local social-cultural identity. Research on flexible production systems (Storper and Scott, 1988) recognises clustering firms' ability to rapidly shift from one process or product to the next staying abreast of industrial change. In her work on New Industrial Spaces (Saxenian, 1994), Saxenian builds on these insights, but highlights the role of community-building and reproduction of social networks and institutions as a prerequisite to making flexible production systems work in practice.

Firms and regions grappling with competition, be it at city, regional, national or at international level form the backbone of Porter's work on spatial clusters of innovation (Porter, 1990). However, when explaining the division of labour among countries, regions, as well as firms, the emphasis is squarely put on the role of market, instead of social forces. Even though lacking in theoretical depth and colour, Porter's subsequently refined model of regional clusters has the merit of being the most practice-oriented in the literature and enjoys a large number of followers, especially among cluster practitioners.

Cluster policy

Clusters have attracted the interest of policy makers wanting to boost innovation in industrial growth sectors such as biotechnology and telecommunications, as well as to generate economic development in disadvantaged localities and regions (Sölvell *et al.*, 2003). As a result, cluster policies and initiatives have proliferated in recent years. Whether clusters occur only spontaneously or whether cluster formation can be encouraged, what if any should be the role of public authorities, these are only some of the questions hotly debated. Meanwhile, decision-makers are looking for good-practice examples of policies that have indeed worked.[2]

The variety in clusters in shape, composition, nature of inter-firm links, and institutions underpinning them is mirrored by the variety in national and local cluster support policies ranging from passive to pro-active strategies. Cluster policies are variously seen as ways to dynamise local economies, facilitating regional industrial reorganisation; as tools to strengthen survival firm through networking relationships or as strategies to use public funds earmarked for development more efficiently.

Criticism

While enjoying wide popularity among local development practitioners and policy makers, the cluster concept has attracted its fair share of critics (Martin and Sunley, 2003). Clusters stand accused of being underpinned by a hazy underlying theoretical concept lacking geographical or industrial boundaries, agency, and clear evidence of associated benefits. It must be recognised that clusters not only grow and prosper, but also decline and die. It appears doubtful for example as to whether the social fabric of Italian industrial districts is currently withstanding trends of off-shoring and outsourcing that often lead to the unravelling of traditional competencies (Rabellotti, 1995). Similarly, an overemphasis is placed on co-operation to the exclusion of negative aspects of clusters, such as power asymmetries in supply chains with larger firms often dictating terms of collaboratoin. Furthermore, the methodologies used to identify clusters is often crude relying exclusively on measuring industry concentrations forgetting that co-location does not always result in clustering. In particular, policy makers stand accused of identifying more clusters than actually exist. Some go so far as to calling clusters a fashion fad and the current "next new thing" in management consulting, pointing to the fact that there is no noticeable trend of economies becoming ever more clustered.

Others criticise the rationale for cluster policy as such, given the fact that clusters are supposed to emerge spontaneously and therefore presumably cannot be created simply by policy intervention. Cluster critics rightfully point out that since there are different cluster typologies, we also need different theories as to how they operate and different methods of policy intervention. Too much emphasis is often put on SMEs and bottom-up approaches, neglecting the role that large firms and governments play (Markusen, 1996). Furthermore driving regional specialisation through cluster development can be a risky endeavour with dangers such as regional economic overheating or vulnerability to shocks being downplayed. In general, critics point out that clusters are no panacea for economic development – on the contrary, clusters can help only a few firms in selected areas. Overemphasis on cluster policies can actually draw resources away from policy for firms that are not in clusters and from regions without

clusters. There is nonetheless much of value in the cluster concept when applied with proper consideration to the potential pitfalls.

Clusters in the post-communist context

Today, countries that have successfully made the transition from socialist economic systems to market economies more than a decade ago seemingly face the same challenges as other OECD countries, namely to increase the international competitiveness of their economies. Clusters, demanding interaction among entrepreneurs and local institutions, co-operation between both local and federal levels of government, as well as co-ordination among various policy areas have the potential to dynamise many local economies in central, eastern and south east Europe.

What were the main characteristics of former socialist economic systems that may influence cluster development today? Property rights were concentrated in the hands of the state with economic activity centrally planned and vertically structured. Economic life under socialism often involved the concentration of industry in highly specialised industrial districts with priority given to heavy industry at the expense of consumer goods. A common feature was the absence of horizontal linkages among economic actors, although informal networks evolved between bureaucrats and industrial bosses to circumvent the rigidities of the planning process. In some countries of the socialist block from the 1960s onward, state-owned enterprises acquired some autonomy in economic reform experiments. In general, economic activity was characterised by the absence of conventionally functioning legal and financial systems and clear accounting standards. These business fundamentals were not necessary as firms ran on soft budget constraints. The population, trained to work in highly specialised fields in state-owned enterprises or bureaucracies, did not hold independent entrepreneurial spirit in high regard.

Since 1989, central and eastern European countries have undergone profound economic and political change. Systems of central planning have been dismantled, industry privatised, trade liberalised and economies generally stabilised and brought on the path of economic growth. In addition, countries have created framework conditions conducive to the operation of private enterprise, such as the establishment of property rights and procedures for licensing and registration of businesses, commercial banking systems, competition and commercial law, codes of business ethics and systems of taxation. Economic reforms have been vindicated by the inflows of foreign direct investment and the emergence of newly founded domestic firms. In those new market economies, SMEs play a particular role

in introducing the notions of entrepreneurship, competition and flexibility, as well as openness to the international economy.

In central Europe, high unemployment is often concentrated in specific regions where large state-owned factories once were the sole employers. To avoid the break-down of social fabric, in some cases, these state-owned enterprises are artificially kept alive by subsidies with a danger of blocking economic transformation and strangling private sector activities. While this phenomenon can also be seen in other OECD countries such as Germany and the Benelux countries, the economic base of central European economies appears to be less diversified in comparison.

Strong regional disparities have also emerged due to the influx of foreign direct investment, as investors have preferred to locate in border regions in an attempt to cut transport costs. Often economic growth and prosperity has remained concentrated in areas well endowed with infrastructure (such as national capitals). Other structural disadvantages include a heavy focus on traditional industries with dwindling international competitiveness and regional reliance on the agricultural sector, itself in dire need of reform. In this respect, Ireland provides instructive parallels, successfully managing to mediate the dangers of a foreign direct investment- and export-led growth strategy. However, transformation of the Irish economy took place over a thirty-year time period and could rely on experienced policy makers and development practitioners.

Other aspects linked to foreign direct investment include power asymmetries in supply-chain relations of small local firms faced with large multinationals. A highly qualified and specialised workforce has been very difficult to retrain to gain the necessary skills to find employment in the new market economies. A special effort needs to be undertaken to upgrade skills to better embed foreign direct investment (Pyke et al, 2002).

But other, less visible elements also prevail as obstacles to economic development in general and cluster building in particular. While framework conditions for business have vastly improved, entrepreneurs complain about red tape and lack of transparency in regulatory frameworks, which can constrain SMEs. In fact, the number of newly founded small and medium-sized firms is steadily declining since its peak in the early 1990s. Change in government often brings unexpected modifications in rules and regulations, while a lack of trained personnel in public institutions at federal, regional and local levels adds to the confusion. Inter-ministerial co-ordination vital to devise strategies fostering economic development is lacking, often leading to contradictory policies. In addition, implementation of programmes at the local level remains weak given the limited availability of knowledgeable and experienced professionals in local and regional administrations.

Attitudes can also stand in the way of entrepreneurial activity. It seems that post-socialist economic systems still cultivate a negative business climate with sometimes disinterested or obstructive authorities on one side and distrustful entrepreneurs on the other. While life under socialism required a high degree of individual entrepreneurial energy and organisation just to provide one's family with the goods of basic necessity, this energy has not been fully harvested up until today. The notion of owning one's own business and of profit-making is still seen as something negative by large parts of society. Entrepreneurs are often hesitant to co-operate both with authorities and with fellow business owners, preferring instead to go it alone. One reason for this could be a lack of social capital in post-socialist societies with social networks very much in short-supply. In Chapter 2, the role that social capital plays in clusters will be outlined in more detail.

Overall, while central European countries use the cluster approach to achieve similar goals as other countries around the world, it is important to take the post-communist context into account when designing, implementing and assessing cluster policies in central, eastern and south east Europe, at least for the time being. As described above and in Chapter 2, differences remain, especially with regard to lack of social capital impeding co-operation among firms and supporting institutions. Other medium-term issues include a shortage of well-trained local and regional economic development practitioners in institutions designed among other things for cluster support. In addition, when evaluating clusters and cluster potential, data shortages often stand in the way of detailed analysis. For these reasons, reaping the results of cluster policies in post-communist countries requires even more serious and sustainable resource commitment and patience than in traditional OECD countries.

Cluster definition and methodology

With the rise of interest in the cluster phenomenon, efforts are being made around the world to develop statistics to identify clusters. As discussed above, this is made difficult by a lack of consensus on cluster definitions and limited data availability. Many attempts are nonetheless being made, often on a case by case basis and with great variation in the quality of analysis.

The identification of business clusters is usually based on four basic methodological approaches: (i) input-output analysis; (ii) calculation of location quotients; (iii) quantitative and qualitative techniques to visualise particular networks/clusters; and (iv) a combination of the above approaches. Special attention needs to be paid to the possibility of clusters straddling statistical boundaries. Furthermore, as clusters are not static

systems, cluster maps can present only a snapshot image in time of clusters that are emerging, growing or declining.

While organising the five OECD LEED/CEI-EBRD cluster seminars in Slovenia, Slovak Republic, Czech Republic, Poland and Hungary that led to this publication, it became apparent that no uniform definition as to what exactly constituted a cluster could be agreed upon by the participants. This analytical challenge resurfaced during the preparation of individual cluster country studies, as it became clear that each country interpreted the concept of clusters in a certain way. This is why the following core cluster definition was provided by the LEED Programme: "A cluster is an agglomeration of vertically and/ or horizontally linked firms operating in the same line of business in conjunction with supporting institutions." This core cluster definition allowed the country experts who prepared chapters 3-7 to focus on certain aspects of clusters in their countries according to their own priorities while at the same time ensuring a basic underpinning of cross-country comparability. Each case study uses a local cluster definition based on the OECD LEED core cluster definition.

A common basic methodology was used in all chapters of this publication to collect and interpret statistical data on industry concentrations and inter-company and inter-industry links. Having divided countries into units of analysis following the OECD Territorial Grid (Level 2 or if desired Level 3), NACE[3] data was used for the representation of economic activity by industrial sector. The clusters identified are industry concentrations, as measured by location quotients.[4] The limited data available prevented input-output analysis and the visualisation of inter-firm and inter-industry linkages. However, a strong correlation exists between clusters and industry concentrations. Furthermore, whenever possible survey work and qualitative information has also been used in individual case studies to provide evidence on interactions within clusters, based on questionnaires to firms within identified concentrations (undertaken in Slovenia, Slovakia and Poland) and interviews with cluster practitioners (Hungary, Czech Republic).

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Endnotes

1 . In recent years, the theoretical debate on clusters has been informed by a focus on innovation triggering a wealth of literature on territorial innovation models (Storper and Scott, 1988; Morgan, 1997; Cooke, 1996).

2 . The OECD has been active in supporting policy development and highlighting good practices in this field. From network characteristics of co-operation and competition in industrial districts (OECD, 1999) to innovation policy, clusters have been an important part of OECD work on how to promote SME development and foster innovation in recent years. The OECD also produced a set of best policy practices to enhance efficiency and effectiveness of the various programmes in question (OECD, 2000). The cluster concept has been placed in the context of fostering entrepreneurship and local economic development (OECD, 2003). Most recently (OECD, 2004), five case studies were commissioned and analysed by the OECD for the purpose of reviewing policy recommendations with regards to clusters.

3 . Poland, Hungary, Czech and the Slovak Republic share the NACE ("Nomenclature statistique des Activités économiques dans la Communauté Européenne") EU data collection standard, which was adopted in order to ensure comparability between national and community statistics of economic activity. Slovenia uses SCA, Standard Classification of Activities Code which is compatible with the EU standard.

4. The LQ is defined as LQ = (Eij/Ei)/(Ekj/Es), where Eij is the numbers of companies in industry j in region i, Ei is the total number of companies in region i, Ekj is the total number of companies per industry j and Es is the total number of companies per country.

Chapter 2

Social Capital: A Key Ingredient for Clusters in Post-Communist Societies

by Dina Ionescu

This chapter explores the role of social capital in shaping inter-firms relations within local clusters and identifies whether a lack of social capital can be considered an impediment to cluster formation and development in post-communist countries.

It is important to note that despite offering a definition, this chapter does not provide one model of social capital, nor define one type of impact on cluster performance. Social capital is one element among many other determinants and studying the link between social capital and cluster performance does not mean asserting that social capital is a positive value *per se* for clusters.

However, attention is focused on some major features that characterise social capital and that positively impact on business clusters development: a sound base of trust among economic and institutional actors, together with valued and acknowledged co-operation.

The chapter is structured as follows: First, parallel definitions of social capital and clusters are provided; second, the links between the two concepts are analysed (in particular the impact of social capital on cluster building and performance); third, specific issues to post-communist countries are raised; and lastly, a policy debate is initiated.

Subject to contradictory definitions, problems of measurement and efforts to analyse its relation to economic growth, the concept of social capital runs the risk of being rejected because of its conceptual limitations.

This chapter aims to offer to offer a better understanding of the social capital concept in its relation to business clusters, through better defining and analysing the concept of social capital and its potential translation into policies. To do so, the following questions are addressed:

- Why is the concept of social capital relevant to the study of business clusters?
- Do business clusters with high levels or specific types of social capital perform better? Can social capital contribute to cluster construction?

- What are the specific challenges in relation to social capital in post-communist countries?

- Is it possible to translate the social capital concept into explicit recommendations for cluster policies?

The relevance of social capital to cluster building

How can social capital be defined?

The OECD has defined social capital in the publication *The Well Being of Nations* (OECD, 2001) as "networks together with shared norms, values and understandings that facilitate co-operation within and among groups." The main interest in studying social capital from the economic and social point of view is that social relations among individuals can represent a positive resource for the economy and society.

This definition calls for two clarifications in the context of this publication: first that we apply this definition to a very particular group, the "business cluster" which comprises a whole range of specific stakeholders (entrepreneurs, enterprises, intermediaries, local authorities, suppliers, distributors etc.) and second that the notion of "trust" is indirectly conveyed by this definition. Trust expresses reciprocity and confidence, both among enterprises and institutions. In particular, in the case of clusters, individual trust in other entrepreneurs and appreciation of the way they "do business" directly impacts on the decision to engage in collaboration.

According to Putman (2000), "the central idea of social capital is that networks and associated norms of reciprocity have value." One question that immediately arises from this definition is what kind of value does social capital give rise to? Diverse research projects have tried to provide answers in the social and economic fields. The World Bank defines social capital as "institutions, relationships, networks and norms that shape the quality and the quantity of a society's interactions", and places the focus on the social dimension. This means that social capital can contribute to fighting poverty and to increasing well-being, thus having an economic impact beyond social objectives.

There is an important step to take from studying social capital from a sociological and societal perspective to reaching the economic and firm level. Research has been undertaken to understand the impact of social capital on economic growth and whether the 'value' Putman speaks of can be translated into increased competitiveness and growth. Many of these studies are undertaken at the economy-wide level, but we aim to look at the particular role of social capital at the micro level, namely its impact on the

performance of firms in local clusters. Social capital is then viewed as more than the sum of different social interactions, but as a source of competitiveness.

Why is the social capital concept relevant to the study of clusters?

Business clusters are based on specific interactions among firms and other organisations, involving a mixture of co-ordination, co-operation and competition and extensive use of market exchanges. If it seems so interesting to look into detail at how social capital can influence business cluster formation and development, it is because of this intriguing nature of clusters, which mix both competition and collaboration ties.

There is a temptation to assert that social capital is inherently part of cluster formation given that enterprises in clusters often develop co-operative relations. However, this would lead to a dilution of the concept of social capital, because social capital is more than social interactions, and to a misunderstanding of the cluster concept, because clusters can exist mainly based on competition. Moreover, co-operative behaviours are not necessarily driven by social interactions and personal knowledge but can be the result of market processes. It is often difficult to identify the limit between co-operative behaviours and social capital, as enterprises and clusters can be embedded in a social, cultural and local fabric. The question that needs to be raised is therefore whether social capital is an advantageous or even necessary ingredient for business clusters.

Recent policy interest in clusters is driven by research and theory suggesting that firms can achieve increased efficiency and competitive advantage through cluster formation, which can translate into economic advantage for the localities and regions concerned. Specific interest in the role of social capital in clusters is also motivated by the argument that social capital can favour the competitiveness of enterprises. For example, the OECD publication *The Well-Being of Nations* asserts that "firms can benefit from norms of co-operation and trust embodied in various types of intra-firm and inter-firm networks". How can social capital concretely contribute in a positive way to a business cluster's results?

Social capital can directly impact on cluster performance in two key ways: (i) supporting innovation and (ii) lowering transaction costs, potentially increasing efficiency and growth.

- **Innovation** in clusters is often based on collaboration, proximity and networks, involving processes of mutual learning, emulation and personal contacts, which in many ways are dependent on the presence of social capital.

- Firms in clusters also benefit from **lower transaction costs** due in some cases to personalised negotiations, fewer bureaucratic procedures, lower information costs stemming from local and personal information flows, better co-ordination because of direct contacts, social exchange and often trust-based relations among economic agents. Again the ability to access lower transaction costs would seem to be closely related to the presence of social capital in a cluster.

But does this mean that social capital is a necessary ingredient for cluster building?

Variety of cluster types: diversity of social capital types

It is important to underline that studying the link between social capital and cluster performance does not mean asserting that social capital is a positive value per se for clusters. There is a multitude of factors influencing cluster performance and examples of successful clusters with limited social exchanges also call for caution so as not to overemphasise the role of social capital in cluster formation.

Enright (2000) proposes a cluster classification that is extremely useful for understanding that the presence of social capital can strongly differ from cluster to cluster:

1. Working clusters (well-developed and industrial districts);
2. Latent clusters (with a high number of firms but a low level of interaction due to the lack of trust, low co-operation and high transaction costs);
3. Potential clusters;
4. Policy-driven clusters; and
5. Wishful thinking clusters (uncompleted as often policy has failed).

In his typology, the 'latent clusters' with a high level of concentration of firms fail to become 'working clusters' because of a low level of interactions due to a lack of trust among other factors. This analysis has implications for cluster policies and the attention that should be devoted to social capital issues, because increasing the level of trust and co-operation among actors might transform latent clusters into working ones. This typology and that of Markusen (1996) referred to in Chapter 1, also underline the fact that there are different types of clusters and different stages of cluster development. It is likely that each will require different policies and that role of social capital will vary between them.

Social capital as one variable among others

Linking social capital and clusters should not lead us to excessively value the role of social capital in cluster expansion. In fact there are contradictory conclusions about the origin of external economies in clusters. According to Rosenfeld (2002), "some external economies are driven purely by the size of the market created by the scale of business and job opportunities and not by trust based relationships or organisational membership commonly termed social capital". For other authors, such as Storper (1997), trust and conventions are critical.

Clearly in some contexts social capital can generate important external economies for firms, associated with personal relations, communications and shared knowledge among cluster participants, and Rosenfeld also notes that in clusters with strong social capital, knowledge and innovation are transferred more readily.

Nonetheless, in comparing Silicon Valley and Route 128, Putnam (2000) notes that two different types of clusters, one with horizontal and university-based links among entrepreneurs and a second with more traditional hierarchical and professional relations, involve two very different different types of social interactions. Moreover, performance seemed to be independent of the nature of social interrelations among entrepreneurs.

These observations illustrate the complexity of the issue and call for deeper analysis at local level. **There is not one model of social capital and not one type of impact on cluster performance.**

Social capital and clusters: a local story?

The OECD LEED programme has been interested in the local dimension of social capital and how it influences cluster development for some years and an important milestone in LEED's work in this field was the international conference organised by LEED in Mexico in 1999, entitled *"Local Economic Development: Social capital and Productive Networks"*. One of the critical concepts underlined in that conference is that social capital can be treated as a "resource" that is less tangible than physical capital but is nevertheless productive because it facilitates the completion of certain objectives, in particular relating to the ability of individuals to undertake entrepreneurial activities and become involved in inter-firm relations at local level.

Two of the conference speakers, Steven Cohen and Gary Fields, backed up this argument with a valuable account of social capital in Silicon Valley, arguing that social capital is a multi-faceted concept subject to interpretations…but key to cluster development. These commentators

argued that the success of Silicon Valley was based on a specific mixture of co-operation and competition, cultural attitudes (employees moving from one firm to another, openness to foreign talents), strong connections with high-level research universities, engaged national authorities supporting high tech solutions, active legal practices and venture capital corporations. All these elements together have created a "local culture" and an original type of social capital. This local identity and way of functioning is very different from how social capital is described in other places, serving to highlight the local nature of social capital.

Thus social capital should be seen as a "local resource" that can differ in content from one location to another. It therefore represents a specific mixture of social, personal, institutional and professional interactions. This raises the question of whether social capital can be created in places where the local conditions are not favourable and as a consequence whether policy can or should build social capital at local level. In order to respond to these policy questions it is first useful to look at the other side of the coin, to the potential negative impacts of social capital on clusters.

Negative impacts of social capital on clusters

Analysing the degree of social capital at cluster level can lead to paradoxical results. On the one hand, it can explain particular local features that are instrumental to cluster formation and competitiveness. On the other hand, it can show up limits of the cluster approach to economic development.

For example, in some cases strong social capital could make it difficult for people lacking the right connections to become integrated in the cluster labour market. This can translate into exclusion of outsiders, limited mobility, poor socio-economic advancement and lack of adaptability to change in clusters. Thus Rosenfeld (2002) notes that cluster development in a given area can transform a neighbourhood, raise the price of property, lead to protecting the local community from outsiders, exclude people who don't have the 'right' connections and impact especially on low or middle income people. As Portes and Landolt (Portes and Landolt, 1996) put it: "The downside of social capital is that the same strong ties which are needed for people to act together can also exclude non-members such as the poor."

In other cases strong ties may lock firms into particular technologies and markets and lead to stagnation. Thus research in OECD countries has shown (Cooke, 2003; Traxler and Psilos, 2004) that successful clusters, are often those open to external markets and competitors and not limited to a very tight local scope. This might imply that policies should seek to favour measures that open clusters and help them connect with the outside world,

rather than support measures that strengthen the local culture and internal social exchanges. However it is difficult to reach such a conclusion since it is likely that both local ties and external ties are important to cluster success.

What is important to retain is that the concept of social capital alone cannot explain the success or failure of clusters. It is only in the light of interaction with many other influential factors that it can be valuable.

How is it possible to single out the role of social capital independently from other factors and thus evaluate its impact on business clusters? Trying to measure and define reliable indicators of social capital is a first challenge.

Measuring social capital

Three key difficulties arise when attempting to measure the contribution of social capital to cluster development. First, a lack of data and problems of definition are major impediments to grasping the significance of social capital in clusters. Second, problems appear when defining and limiting the boundaries of clusters since clusters are often entities in flux and difficult to delimit. Third, measuring the impact that social capital has on the performance of firms and of clusters as a whole is a complex exercise which has to take into account many other factors that impact on cluster performance. All these issues make the subject of 'social capital and clusters' complex and quite difficult to approach.

A conference organised by the OECD in 2002 in London on *"Social Capital: The Challenge of International Measurement"* raised many significant questions on the comparability of existing data on social capital across countries and fields of investigation (e.g crime prevention, education, local development), making a very useful update on where different countries stand regarding measurement of social capital. It appeared that for instance, the national statistical authority of Finland had already developed a database on social capital, the New Zealand Statistical Office had an agreed framework of measurement and that the UK Office for National Statistics was leading a harmonisation programme. Other countries were undertaking specific surveys measuring social capital among other variables or were executing small scale studies. There was a clear interest in the subject and participants agreed on some key aspects that need to be included in social capital measures, including community participation, informal networks, trust and political participation.

Many issues are left open, such as the most appropriate unit of analysis (social capital can be measured at different levels such as local neighbourhoods, families, schools, or the work place), the impact of measurement on policy and the international harmonisation of notions such as 'volunteering' that have diverse connotations. However, efforts are being

made to measure social capital, usually mixing quantitative and qualitative data. The World Bank Social Capital Initiative for example is currently funding projects that will help define and measure social capital, its evolution and its impact, where: "The proposed analytical methods cover a wide range of qualitative and quantitative approaches. These include quantitative methods in formal research designs with use of control groups, econometric analyses calling on instrumental variables and principal component approaches, as well as case studies, qualitative and inductive methods."

The sources of social capital are multiple, as shown for example in (OECD, 2001), which cites the influences of family, school, local community, firms, civil society, public sector institutions, gender and ethnicity. Many of these sources of social capital are also central elements in cluster formation and development: for example firms, family links, education, community, women's networks, ethnically related groups, public, private and non-governmental institutions. It is important to develop reliable indicators related to the factors that could express the level of social capital in clusters. Some potential indicators might include membership of associations, use of informal networks in business transactions, participation in advisory or mentoring programmes, use of communication tools (news letters, phone lists, web-based discussion boards), belonging to a school or university network, voluntary activities, degree of trust in institutions, willingness to work and collaborate with other companies and the feeling of belonging to a specific entity. Further research is needed to make the link between the presence of these factors in clusters and cluster performance.

Understanding criticisms of the social capital concept

In the following paragraphs, we briefly address the main points of criticism raised against the concept of social capital. It is important to address these criticisms in order to progress and refine the concept and its measurement.

- **"If you can't measure it, it isn't reliable"**: A major criticism of social capital comes from the difficulty of measuring such a concept and especially measuring its impact on economic performance. It portrays reality in motion, surveys are often based on questionnaires trying to capture beliefs and behaviours and indicators measuring social interaction or civic attitudes might not be conclusive in explaining economic interactions. OECD work on measuring social capital clearly shows the challenge for the development of harmonised indicators. However, problems of measurement should not be an impediment to social capital research. On the contrary they should motivate it.

- **"Social: Yes. Capital: No."**: The notion of social capital suffers from the extended use of the term "capital" as an analogy to other types of capital (physical and human). The success of the concept has been associated with a double use: both in a purposefully economic sense and metaphorically. The "capital" nature of social capital is increasingly documented through economic analysis dealing with its accumulative nature and its key role in lowering transactions costs. Meanwhile, the term is also used metaphorically, aimed at underlining the critical significance of social interactions. This leads to the popularisation of the concept together with a certain dilution of the original economic perspective.

- **"Limited impact on economic performance"**: Because of the large number of factors that impact on SME performance or play a role in cluster development it is indeed difficult to single out and isolate social capital. However, this does not mean that social capital has a limited impact on economic performance.

- **"Conceptual inflation: Social capital is THE missing link"**: Again, it is the success of the concept that has brought this criticism. Social capital is now an integral part of the study of migration, criminality, education, gender, micro credit and poverty, to name just a few. But the use of the concept tends to take on slightly different meanings in each case and cannot be measured along the same indicators, thus resulting in an understandable confusion.

- **"Fuzzy and chaotic concept":** Despite its success, the concept of social capital is still in its early stages. Over the last ten years, a number of studies using social capital to explain economic performance and regional development have led to an increasingly refined concept. Authors such as Putman built upon their early definitions. More consideration is given to the interaction of social capital with other factors, such as foreign direct investment or exports. Studies looked at the regional versus global nature of social capital, raising the issue of embeddedness of SMEs in the local environment versus autonomy and external links. The vocabulary expressing the concept has greatly evolved and is symbolic of the search for a nuanced understanding. Variations are numerous: 'Pecuniary social capital' (Cooke and Clifton, 2002), "bridging and bonding social capital" (Putman, 2000), "old boys social capital"(Raiser 1999) etc.

- **"Circular thinking":** Criticism has been raised concerning the difficulty of differentiating between the causes and effects of social capital. Thus Portes and Landolt (1996) point out that studies tend to amalgamate social capital and the benefits derived from it, whilst Ponthieux (2003) denounces the circularity of the concept, with social capital being an input and an output. The

ambiguity of the "egg and chicken" story of social capital shows the complexity but also the richness of the concept.

- **"An interdisciplinary challenge"**: The interdisciplinary nature of social capital nourishes its originality and intricacy. A sociological concept at first, it is now often used in economics, entailing conflicting definitions and measurements. As Landabaso (2003) reminds us, "The contributions (on social capital) often come from regional development specialists that have a soft spot for a multidisciplinary approach to understanding economic development, in the best political economy tradition, which incorporates geography, sociology, institutions, culture and politics into it. One of the good things about them is that they do not excuse themselves for doing so."

- **"A collective or individual notion?":** By its 'social' nature, social capital tends to be considered as a collective phenomenon. It is expressed at the regional or national level, which leads indeed to generalisations. However, it seems imperative to remind ourselves that social capital is about social interactions and collective behaviours, but it expresses individual beliefs and attitudes.

Can social capital contribute to cluster construction?

Social capital and economic performance

Social capital has been identified as an integral component of social and economic development at both macro and micro levels. At macro level, Putman (1993), Helliwell (1996) and Fukuyama (1995) have found that regional measures of social capital correlate positively with various indices of economic performance. These studies seem to show that greater social capital translates into improved economic performance, although these conclusions have nevertheless been contradicted by research done in the Denmark, Ireland and Wales, which shows the complexity of the social capital notion applied to regional performance, and will be discussed further below (Cooke and Clifton, 2002).

At micro level, Paldam and Svendsen (2000) argue that social capital can be important for production in three ways: i) as a factor of production in parallel with physical and human capital; ii) as a determinant of transaction costs; and, iii) as a determinant of monitoring costs. According to this economic rationale, entrepreneurs would make the rational choice to maximise their personal profit by deciding to interact and invest in social relations.

Social capital, SME performance and clusters

The results of extensive research conducted in Denmark, Ireland and Wales led by Philip Cooke and Nick Clifton (Cooke and Clifton, 2002) showed that social capital is consistent with high performance, innovation and knowledge intensity. The research looked at government programmes promoting collaboration among SMEs with the objective of improving the capacity to innovate through increasing social capital by supporting networking among SMEs. According to Cooke and Clifton, "social capital in the world of the real economy is a kind of entry ticket to doing business."

Nevertheless, it does not appear to be a necessary condition. The results showed that the most competitive regions are indeed the most pronounced users of social capital. Firms with greater innovation capacity tended to show higher trust in collaborators, to exchange information outside the normal commercial links, to rate external information higher, to develop strategic contacts and to consider co-operation as more beneficial than other SMEs. However, from a cluster perspective it appears that these highly innovative SMEs are global rather than local in the social and professional contacts they develop. Hence, innovative SMEs are high users of social capital but not necessarily at the local level.

Further evidence on the effects of social capital on SME performance is provided by Cooke (2003) researching twelve UK regions. The author led a large scale survey putting together social capital indicators (mutual trust, exchanging favours, judging reliability, credibility and reputation) with performance indicators (profitability, turnover, innovation and employment growth). The significance of this study is to outline that social capital seems to be an important factor in innovation and improved performance. But this seems to be especially true when a business is less locally focused and more internationally oriented. Social capital also seems to be highly valued in less well performing areas of the economy, but is **not a sufficient** variable to lead to improved economic performance.

Overall, social capital seems to be a significant factor for SME and cluster performance because it produces untraded benefits. Thus formal and/or informal partnerships, networks and cluster-based initiatives that promote mutual trust, credibility, reputation and the exchange of personal favours can contribute to SME profitability, turnover and innovation. However, this social capital is not necessarily always local and is not necessarily sufficient to drive strong cluster performance.

Social objectives and economic performance

Until now we have considered cluster performance as an objective and social capital as a possible tool to achieve it. However, we can also take a

different perspective considering clusters as privileged places to create social capital, with social capital building becoming the objective and not the means.

In the publication *"The Well Being of Nations"*, the OECD (2001) recognised that social capital contributes to realising human potential and social cohesion and to fighting poverty. Stating the importance of social capital as a component of clusters raises the question of whether cluster policies should broaden their scope and put forward the objectives of social cohesion and equity in addition to entrepreneurial innovation and performance.

The literature on social capital usually deals with civic engagement, community building, corporate social responsibility, housing schemes, neighbourhood regeneration programmes, partnerships, safety and health projects or education and non-governmental activities. Studying social capital in clusters therefore opens up the debate beyond clusters as motors for economic growth and innovation, to clusters as places for civic engagement and community building. It raises questions about the possible scope and role of clusters beyond the economic rationality of entrepreneurs. This is particularly interesting for post-communist countries that have undertaken a major economic and political transformation, where the civil society has recently been rebuilt or is still "under construction". However, it is important to decide whether the cluster policy is part of a business or social agenda, or both, and to avoid overburdening the cluster approach with social goals that might be difficult to achieve.

The challenges of social capital in post-communist countries

Why does social capital matter in post-communist countries?

The discussions at the conferences and seminars that led to this publication all put forward the idea that trust, collaboration and social-civic exchange can be keys for cluster development. Furthermore, case studies from Ukraine, Lithuania, Latvia and Estonia pointed to the lack of a "culture of collaboration" as an important barrier to cluster formation. More recently, the LEED programme has extended its work on enterprise clusters to Romania and Croatia with seminars in 2004 in Timisoara, Romania, and Hrvatska Kostajnica, Croatia. Both countries feature particular challenges, due in the case of the first to the tough authoritarian regime that deeply destroyed social and civic bonds, and for the second to the impact of the civil war in the early 1990s. These seminars raised again the issues of lack of trust and collaboration as major barriers to cluster development. Thus despite the great economic and political advances that have been made in Central and Eastern Europe, it seems that the former centralised regimes, in

spite of some being more open than others, left a common legacy: a lack of trust and a fear to collaborate in business.

On the other hand, however, there also appear to be very close family or private ties in the countries examined. The **paradox is that these two opposed tendencies can both be considered as social capital**. This dual phenomenon, which appears to be widespread in transition economies requires deeper analysis and understanding.

Socialist and communist regimes have contributed to the destruction, or at least the inhibition of key elements of a culture of entrepreneurship with consequences for SMEs and cluster development today. A centralised economy, an all but exclusive public sector (even if some countries such as Hungary and the Czech Republic experimented with loosening the reins of central control), an unenthusiastic working class ("they pretend to pay us, we pretend to work"), soft budget constraints and economic and political power concentrated in the hands of a powerful nomenklatura have left their mark.

Two phenomena developed as a response to a system of total state control. At the politico-economic level, privileged informal relations were built to navigate the command economy and to procure political and economic favours. Outside of the party structure, closely-knit relations among an inner circle of friends and family were developed as an antidote to state intrusion. In addition, a host of social interactions were devoted to the fulfilment of every day needs, as almost everything had to be negotiated and bartered in intricate ways.

After the downfall of communism, there was an unravelling of the forced culture of co-operation and reciprocity, as the market economy was now delivering all kinds of goods and services without lengthy transactions. What remained from socialist times however was a lack of trust in institutions, politicians and laws, as well as some extremely opportunistic behaviour often needed in a shortage economies. With regard to political networks, the preferential relationships developed during socialist times often remained to secure a head start over newly emerging entrepreneurs.

This has often translated into great isolation of newly emerging private firms and entrepreneurs who find themselves isolated from other firms and entrepreneurs, as well as isolated from the public sphere and the academic world. The volatile environment during transition, with changing rules and insufficient legal framework have further fed mistrust. Entrepreneurs became suspicious that the public sector was not supporting them, firms were afraid to have their ideas and capital stolen, while the population reacted negatively towards these new profit-making entities.

Trust in transition economies has been studied empirically at the European Bank for Reconstruction and Development (EBRD) by Martin Raiser together with a group of researchers (Raiser et al, 2001) based on data from the World Values Survey 1990-1995 and compared with the EBRD's Business Environment Survey. The study showed **significant lower degrees of trust** and civic participation in post-communist countries, although trust in public institutions was positively correlated with growth.

The seminars and case studies of five countries presented in this publication did not explicitly prompt discussion and analysis of social capital. However, in all of the countries there is evidence that points to the significance of the "cultural" and "social" setting as one of the many factors that influence cluster development. The importance of social capital is evoked in situations ranging from firms being unable even to envisage possible co-operation to companies fearing collaboration because of expected breaches of trust or in other cases, firms being more likely to co-operate due to historical links, individual leadership or entrepreneurs simply knowing each other. Overall, a general conclusion can be depicted; co-operation might be valued in post-communist countries but seems difficult to achieve as a strategy.

Reconstructing and deconstructing social capital: The paradox of post-communist countries

Countries involved in conversion at political, economic and social levels face a paradox. They need, on the one hand, to rebuild social capital at the level of associations, networks and foundations rekindle trust among individuals and in public institutions. On the other hand, they need to control certain existing forms of harmful social capital described above, such as informal political and economic 'old boys' networks sometimes with links to organised crime and over-reliance on personal connections and family ties. This **dual social capital challenge** is relevant to all transition economies, to different degrees.

Mateju (2002) writes that indeed two types of social capital are present in transition economies: One type of social capital drawing from general trust and a second one stemming from informal networks and exchanges among people. Corruption and opportunistic behaviour directly feed into the second type of social capital. If the first type of social capital is rather weak in transition countries, the second one, on the contrary, is strong.

This dual vision corresponds to the sociological approach to social capital that distinguishes between social capital as a 'collective attribute' (trust in institutions, media, reciprocity) and an 'individual attribution' (one person linked with a ring of acquaintances, family and friends). It also

matches Putman's dual vision of social capital as 'bridging' (across groups) versus 'bonding' (within groups, affective dimension).

A parallel can also be drawn to the political science debate on private and public spheres: The first type of social capital is public (the individual within society, relations with institutions and public organisations) and the second one is private (among people you know). Communist regimes intended to control the private sphere. However, the economic deficiencies of the system gave rise to informal networks for exchange goods and services as an alternative to state structures.

The two types of social capital can have contradictory effects, the first contributing to a well-functioning market economy, the second impeding market mechanisms via parallel networks and black market exchanges. Both types of social capital need further research and documentation.

However, a caricaturised presentation of two opposed types of social capital might lead to an oversimplification of the debate. Informal social capital that occurs within the family circle could be transformed into a source of extended social trust if the general economic and institutional environment evolves. In a recent study on the formation of social capital in Eastern Europe having recently joined the Europea Union, Fidrmuc and Gërxhani (2004) found that the gap in social capital can be largely attributed to economic and institutional difficulties. This suggests that improving the economic and institutional contexts is likely to have positive impacts on trust and social capital. The authors also found a clear link between human and social capital, suggesting that increasing human capital may also have positive impacts on social capital.

Overall, social capital building is a very slow process and while it appears that policies may be able to encourage and accelerate this process in transition economies it is crucial to research further how public authorities can engage productively while leaving enough space for self-enforcement.

Recommendations for social capital and cluster policies

The final part of this chapter discusses how to translate the positive potential of social capital into cluster policies. To do so, three questions are successively raised:

- Can social capital be created?
- What are the means and tools available to policy makers to build social capital?
- If social capital can be built, what kind of business clusters strategies should policy makers embark on?

A set of proposed policies for social capital building as part of cluster development strategies in Central and Eastern Europe are then put forward.

Can social capital be created?

Research shows that social capital, like clusters, is difficult to 'construct' and top-down policies aiming at building clusters from scratch are often unsuccessful. Rather, public intervention should play a catalyst role, supporting existing or emerging clusters. Like clusters, social capital stems from a particular historic, cultural and social context. Thus Putman (1993) focuses on a non-hierarchical social organisation, Fukuyama (1995) on decentralised governments and Evans (1996) on competent public administration as explanations of strong levels of social capital in some regions and localities. Clusters and social capital are both deeply rooted in a local culture where overlapping social and business ties create a complex social fabric.

Nevertheless, other empirical studies have shown that public support to social capital through promotion of business networks can have a positive impact on cluster building and on the performance of firms (Cooke and Clifton, 2002). Wales, for instance, sought to create supplier clubs and business networks to compensate for a lack of spontaneously forming networks, and this with a positive response. The Hungarian case study in this publication outlines how the national cluster development policy has successfully improved co-operation and exchange among Hungarian firms.

Approaches to building social capital in clusters

As existing cluster examples seem to show that trust and co-operative behaviour can be encouraged and that that those strategies can have a positive economic impact, what does this mean for local development policy? What kind of tools can be used by policy makers to support positive social capital building both in nascent and working clusters?

The municipality of Philadelphia, Pennsylvania, United States, through the Philadelphia Industrial Corporation identified social capital as a key issue to industrial revival and targeted social capital building in its local development programme. The programme (see Box) had the double objective of improving the competitiveness of firms and encouraging their embeddedness in order to support local revitalisation through business development. The local development strategy of Philadelphia is of great interest to policy makers in transition countries, as it proposes concrete measures targeting social capital as part of a local development strategy.

Building Social Capital : A new strategy for Retaining and Revitalising Inner-City Manufacturers

Philadelphia Industrial Development Corporation, USA

The Urban Industry Initiative (UII) was designed as a three-year pilot project of the Philadelphia Industrial Development Corporation (a partnership between the City of Philadelphia and the Greater Philadelphia Chamber of Commerce). The mission is to retain and strengthen neighbourhood-based manufacturing businesses in Northeast Philadelphia USA (330 firms, employing 13,000 people, selling over USD 3 billion worth of products and services). In 1997, UII identified local economic needs through firm interviews. This work led to the design of the "New Strategy for Revitalization" directly based on building social capital among firms.

Among the issues identified by UII as problematic to the industrial development in the area was that fact that: "firms are extremely isolated, the social and economic threads that once existed in the area have come undone as many firms moved or closed their doors, as a result of isolations firms have no reference points by which to measure current performance, ability and willingness to change is low, second and third generations do not have the same entrepreneurial spirit". A "lack of trust" was identified as a limit to enterprises using business services, despite being well aware of their existence.

The conclusions drawn from the research were that "relationships of trust must be created" and firms must be helped to "become more competitive and strengthen their roots to neighbourhoods".

Key elements of the approach used to building social capital are as follows:

- Entrepreneurs were amazed to discover that they shared the same problems. The programme helped identify common needs specific to a region that has suffered from industrial transformation. It initiated inter-firm projects such as a joint electricity purchasing programme, resource borrowing etc.

- A number of initiatives for social capital building were set up: Manufacturers' Meetings, quarterly open networking forums with firm-to-firm interactions, Plant Manager Networks to break isolation among middle management, a Supplier Alliance, an Industrial Marketing Programme, a Shared Source Initiative for SMEs, an Industrial Park initiative, Matchmaking Local Expertise, Mentorship efforts, and linkages with other networking initiatives.

The key message is that:

"Building social capital requires a different kind of effort, with what we call industrial organising, we are creating the conditions that enable firms to work collectively to achieve a multiplicity of ends."

Source: Lichtenstein (1999)

Some cluster "success stories", in which local social capital was identified as a key element, offer further food for policy thought, even though cluster formation derived from private initiatives and not through policy guidance.

For example, the Scottish Digital Media and Creative Industries Cluster Initiative, studied by Sölvell (2004) attracts attention to a simple but central feature of building social capital: help dialogue, personal communication and a common language. Two hundred representatives of creative companies were asked in 1999 at a plenary symposium: "If there was one single thing that Scottish Enterprise could do to promote the growth of this cluster, what should this be?". Their answer was: "**Keep us talking to each other**."

In the case of the Pre-Fabricated Log Homes and Complementary Products Cluster in Western Montana, USA (Rosenfeld and Swanson, 2004), the cluster structure developed as a result of private sector decisions. In the Bitterroot Valley, because of a very close-knit community, social capital featured in the shape of exclusive relationships. This initially acted as an impediment to co-operation, as competitors used to think that they were all 'enemies'. Some personal decisions to start co-operation overcame this state of mind through the building of new neutral structures. As an entrepreneur said: "The best thing about our organisations is in learning what someone else is doing and what may be beneficial to you. We still compete but we understand the value of co-operation". Policy action can contribute to changing negative dimensions of social capital into positive ones through education and training measures as well as through the creation of neutral communication spaces for entrepreneurs.

The example of the Southern Italian Jewellery Cluster (see Box) attracts attention to some elements instrumental to cluster development such as the right assessment of common needs and active leadership. It was not a social connection that started the cluster but the shared risk related to the jewellery industry, leading enterprises to take the decision to share some of their security costs. This common need set in motion a process that led to results surpassing any of the initial expectations. This could happen only because, in addition to the risk, the entrepreneurs shared norms, values and understandings that facilitated their co-operation.

Southern Italian Jewellery Cluster: Challenges and benefits of social capital in a high risk industry

Centro Orafo Il Tari (Marcianese Region)

Close to Naples and born "by chance", the Orafo cluster is a most interesting model for policy action and the issue of social capital. The cluster is formed of 320 goldsmiths and workshops which produce jewels with a yearly turnover of approximately EUR 1 billion. The cluster core is Il Tari, a Consortium of 320 associate companies that share common services and an exhibition area, organising a biannual fair bringing together more than 20,000 people. The Foundation Il Tari (Goldsmith association) has been active since 1991 in training the young. Tari Industriale is a structure that offers resources in technology, professional skills and creativity.

The cluster was born through the decisions of many already existing small companies that decided to pool resources to protect themselves against the frequently occurring break-ins and hold-ups. The success of the cluster is based on a very unambiguous **identification of requirements** and needs which permitted the **design of appropriate instruments and measures**. The second key for success is the involvement of **all significant actors** at local level, SMEs, decision makers, local bodies, the provincial government, the regional government and industry associations.

In getting together, the SME part of the cluster achieved benefits going well beyond the level of security and safety originally sought, such as better quality of life, better negotiation power when asking for public funds, better logistics solutions, as well as an unexpected increase in real estate value. The economic performance of individual companies also increased. Today, the cluster has advanced resources such as information and communications technologies, training and marketing initiatives, legal and financial help that an SME alone could never afford. Moreover, the positive cluster experience radiated far beyond its core group having a strong regional development impact.

Source: Presentation by Carlo Borgomeo, Vice Chair, OECD LEED Committee, OECD LEED Directing Committee Meeting, November 2003

What should policy recommendations take into account?

'Caution' seems the key word to come to mind when cluster policies try to integrate social capital dimensions. Why?

- Designing policies targeting social capital in clusters seems a risky process because social capital building is a self-enforcing, culturally defined and long-term process.

- Social capital can be a negative variable responsible for immobility, exclusion and limitation of economic reforms.

- It is just one variable among many others that might improve cluster performance in a specific environment.

- From a social perspective, supporting social capital can become an objective in itself, therefore, policy makers must carefully evaluate its place in economic cluster policies.

Nonetheless, Rosenfeld (2002) considers that the case for social capital as a cluster policy tool is double. On the one hand, it has an institutional dimension: "The major economic policy issue facing those designing cluster-based development strategy, is evaluating the need and devising the best role for the public sector in creating a social structure for the cluster." On the other hand, it has a social dimension: "The major social issue is taking some responsibility for ensuring that social capital is fairly distributed and accessible".

Furthermore, encouraging results are conveyed by the research undertaken in Wales, Ireland and Denmark showing that "policies that aim to build up social capital for SMEs through encouraging and incentivising collaboration and networking produce results whereby significant portions of the surveyed SME population ascribe improvements in business performance, innovation and knowledge exploitation to the newly formed social capital." (Cooke, 2003)

Policy recommendations should take into account the self-reinforcing and bottom-up dimension of both social capital and cluster building. Entrepreneurs are not very eager to see an institutionalisation of social capital, which takes value precisely from its informal nature. Thus policy makers face the challenge of striking a balance between offering support versus leaving space for an independently budding phenomenon.

Three main potential areas for policy intervention to build social capital in Central and Eastern Europe can be identified from the meetings and research that were carried out for this publication:

- Social capital means communicating across professional boundaries, exchanging with educational institutions and the public sector. This places partnerships among the public, private and non-profit sectors at the core of cluster policy.

- Concrete measures targeting social capital involve networking activities (e.g. professional cluster consultants and business support centres), civic involvement (e.g. supporting voluntary activities) and human capital building (e.g. capacity building, education).

- Building trust is at the heart of social capital issues and has a direct impact on economic relations (between suppliers, clients, partners etc.).

Paldam and Svendsen (2000) remind us that "governments and international organisations are third parties. They may aim at increasing social capital, but their interference might do more harm than good to social capital." Their action should therefore concentrate on indirect measures as facilitators and accelerators.

Recommended policy measures

The Box below sets out a proposed list of concrete measures that can contribute to social capital building within a cluster development strategy.

Proposed policy measures for social capital building in clusters

- Undertake research to identify and assess the level of social capital at regional level, through defining key indicators (mutual trust, role of credibility and reputation, belonging to networks, channels of information exchange, participation in associations, belonging to the same universities etc) and undertaking surveys.
- Assess the role of social capital in cluster creation (latent and potential clusters) and identify gaps.
- Evaluate performance of existing clusters and levels of social capital (in both spontaneous and policy-driven clusters) through linking indicators of social capital and performance.
- Target trust building by setting suitable framework conditions via property rights, codes of business ethics, procedures for licensing and registration, intellectual property rules, systems of taxation, rules for competition, commercial laws, as well as codes of conduct for the police, to name just a few.
- Encourage the rise of neutral cluster structures that support the process of needs assessment at regional and local levels.
- Support dialogue among entrepreneurs at local level through workshops, associations, fairs, events etc.
- Sustain negotiation among private and public actors as a way for overcoming bureaucratic attitudes.
- Professionalise the role of cluster facilitators who should have good working networks.

- Develop policies sustaining human capital development through education, training and leadership in order to retain young talents and to overcome the lack of engagement from management.
- Introduce networking objectives within local policies targeting SMEs.
- Encourage public private partnerships.
- Strive to limit negative features of social capital in clusters (exclusion of specific socio-economic groups, insularity, immobility and criminal networking) through supporting external co-operation, mobility, anti-corruption laws and clear rules.
- Pay specific attention to the issue of social capital in clusters built around large firms and in particular multinationals.
- Adopt an integrated socio-economic approach with both social (community building, social cohesion) and economic objectives (equitable growth, cluster sustainability).
- Conduct evaluation exercises of cluster policies that try to influence cluster results by social capital building.

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PART II

CLUSTER COUNTRY CASE STUDIES

Chapter 3

Slovenia

by Mateja Dermastia

This chapter presents cluster development in Slovenia in the period from 1999 to 2002 covering the process of identifying clusters in Slovenia and the formulation of Slovenian cluster policy. The institutional framework for SME support and for the development of local clusters is presented, as well as the challenges of internationalisation that Slovenian industry and its clusters face today.

Local cluster mapping methodology

Identifying industry concentrations

The working definition used for the research into clusters in Slovenia (see Box) is in accordance with the OECD LEED definition of clusters as agglomerations of vertically and/or horizontally linked firms operating in the same line of business in conjunction with supporting organisations.

Mapping of clusters was undertaken using comparative calculations between the twelve Slovenian regions and the country as a whole based on two-digit or one-digit Standard Classification of Activities (SCA) code. Location quotients (LQs) were calculated for numbers of companies, employment, gross value-added (GVA) generated per company and the GVA generated per employee by industry. On the basis of this analysis, criteria were defined to identify key activities in a region, which could form the core of a potential cluster. Activities that whose LQ scored above 1.5 on at least three of the criteria outlined above were identified as leading regional industries. At an average of 4.7 activities per region, around 10% of the 46 industries identified by SCA code fell into this category.

Identifying linkages

A sample of companies in the identified concentrations was defined for qualitative analysis. The company survey enabled the most important inter-company links (e.g. with suppliers, producers, customers, competitors) and links between companies and the support environment (with R&D institutions, education institutions, etc.) to be identified. Inter-company

linkages were assessed at the regional, inter-regional and international level. The analysis was conducted on the basis of primary research including extensive surveying of companies by mail, followed by interviews with selected companies and a series of workshops with business leaders and other regional key players. Research involved 1,700 companies, institutions and organisations. The concentrations with the strongest linkages were identified as clusters.

Identifying innovative clusters

As one of the main challenges for Slovenian industry lies in upgrading its innovative potential, a review of certain innovation factors (e.g. patents, qualifications structure, employment in R&D departments, export-orientation) was undertaken to rank the clusters in terms of their innovative potential. Key industry innovation indicators, such as number of patents, qualification structure and export orientation were analysed, to be followed by in–depth analysis of the innovative capabilities of individual companies based on data obtained from questionnaires and interviews. Data analysed were companies' investments in R&D, number of R&D projects, number of employees in R&D departments, as well as utilisation of ICT. Those clusters with highest innovative potential were identified as those with the greatest scope for future cluster development in Slovenia.

The clusters

The results of the work to identify industry concentrations are set out in Figure 3.1 and Table 3.1.

A linkage within a concentration was defined as a flow of goods between a supplier and a customer, a flow of information between companies that may or may not be in a supplier/customer relationship, a flow of information between companies and agents of know-how (e.g. research institutions, universities), a flow of information between companies and various educational institutions, and any other flow of information that affects a company's competitive position.

Studying these linkages allowed the identification of key clusters with a) similar or complementary products and services, identical/similar inputs or technologies, or other links on the supplier side and/or b) links with development institutions (universities, individual faculties, R&D institutions) that provide specialist know-how, technologies, information, capital or infrastructure, or meet the needs of product/service systems in any other way.

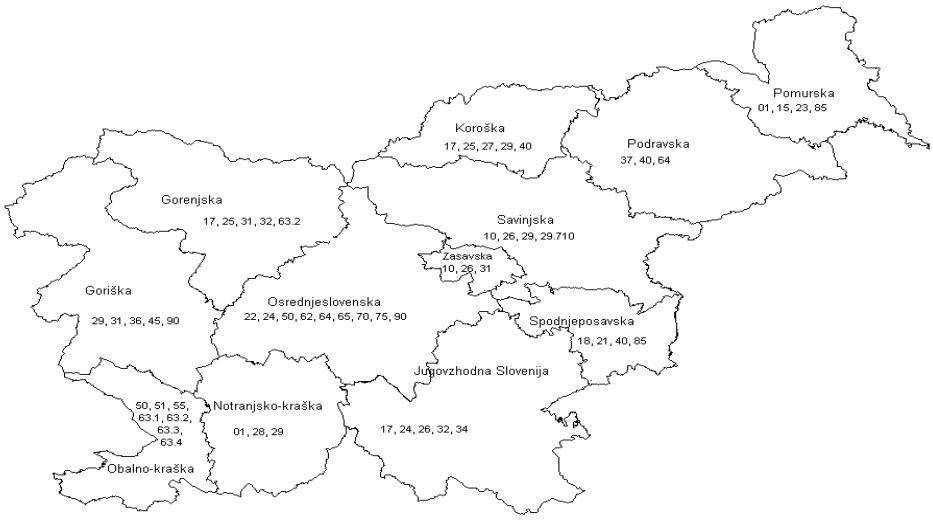
The numbers refer to the industry codes of the concentrations. Corresponding industry names are provided in Table 3.1

Table 3.1 Regional profile of leading industry concentrations

Region	Industry concentrations
Jugovzhodna Slovenjja	17 Manufacture of textiles, 24 Manufacture of chemicals & chemical products, 26 Manufacture of other non-metallic mineral products, 32 Manufacture of radio & TV equipment, 34 Manufacture of motor vehicles, trailers & semi trailers
Goriška	29 Manufacture of machinery & equipment, not elsewhere classified, 31 Manufacture of electrical machinery & appliances, 36 Manufacture of furniture, 45 Construction, 90 Sewage and wastedisposal, sanitation & similar activities
Gorenjska	17 Manufacture of textile, 25 Manufacture of rubber & plastic products, 31 Manufacture of electrical machinery & appliances, 32 Manufacture of radio & TV equipment, 63.2 Other supporting transport activities
Notranjsko-kraška	01Agriculture, 28 Manufacture of processed metal products, except machinery & equipment, 29 Manufacture of machinery &equipment, not elsewhere classified
Obalno-kraška	50 Sale, maintenance & repair of motor vehicles, retail sale, motor fuel, 51 Wholesale trade & commission trade; except for motor vehicles & motorbikes, 55 Hotels & restaurants, 63.1 Cargo handling & storage, 63.2 Other supporting transport activities, 63.3 Activities of travel agencies & tour operators; tourist assistance, 63.4 Activities of other transport agencies
Osrednja Slovenska	22 Publishing, 24 Manufacture of chemicals & chemical products, 50 Sale, maintenance & repair of motor vehicles, retail sale, motor fuel, 62 Air transport, I/64 Post & telecommunications, 65 Financial intermediation, except insurance & pension funds, 70 Real estate activities, 75 Public administration & defence, compulsory social security, 90 Sewage & waste disposal, sanitation & similar activities
Podravska	37 Recycling, 40 Electricity, gas, steam &hot water supply, 64 Post & telecommunications
Pomurska	01 Agriculture, 15 Manufacture of food products & beverages, 23 Coal processing, refined petroleum products & nuclear fuel, 85 Health and social services
Savinjska	10 Mining & quarrying of energy producing materials, 26 Manufacture of other non-metallic mineral products, 29 Manufacture of machinery &equipment, not elsewhere classified, 29.710 Manufacture of electric domestic appliances
Koroška	17 Manufacture of textiles, 25 Manufacture of rubber & plastic products, 27 Manufacture of basic metals, 29 Manufacture of machinery & equipment, not elsewhere classified, 40 Electricity, gas, steam & hot water supply
Zasavska	10 Mining & quarrying of energy producing materials, 26 Manufacture of other non-metallic mineral products, 31 Manufacture of electrical machinery and appliances
Spodnjeposavska	18 Manufacture of clothing, dressing & dyeing of fur, 21 Manufacture of pulp, paper & paper products, 40 Electricity, gas, steam & hot water supply, 85 Health and social services

Twenty-one key clusters were identified and are shown in Table 3.2 by region of the leading industries. These can be considered as the key clusters in Slovenia, with not only industry concentrations but also inter-firm and inter-organisational linkages.

Figure 3.1 Map of industry concentrations in Slovenia



Source: Slovenian Ministry of Economy, 2002

Table 3.2 Key clusters by region

Cluster	Region
Machine Tools	Koroška
Electrical/optical	Gorenjska, Goriška, Zasavska, Ljubljana
Industrial process control equipment and measuring instruments & appliances	Gorenjska, Zasavska, Ljubljana
Domestic appliances	Savinjska, Notranjsko Kraška, Gorenjska
Automotive (incorporating four sub- systems)	Dolenjska, Goriška, Obalno kraška, Koroška, Savinjska
System for the production of suctions units	Goriška, Gorenjska, Notranjsko Kraška
Textile	Spodnje posavska, Dolenjska
Wood processing	Notranjsko Kraška, Gorenjska
Construction	Zasavska, Savinjska, Dolenjska, Gorenjska, Goriška
Transport - logistics	Obalno Kraška, Notranjsko Kraška
Energy production	Podravska, Spodnje posavska, Goriška
IT technologies (incorporating two sub- systems)	Ljubljana
Publishing	Ljubljana
Spa tourism	Pomurskae
Adria coast tourism	Obalno kraška
Food processing	Pomurskae

The key clusters were then assessed according to their potential for innovation. Clusters were classified as innovative if their companies showed a high level of mutual co-operation, both at the customer-supplier level, as well as at the level of developmental activities, and co-operated intensively with universities, development institutions, and with other education and training organisations. These collaborations had to be innovative. In accordance with these criteria, the innovative clusters in Table 3.3 were identified.

Table 3.3 Innovative clusters

Product/ Service system	Statistical region
Machine Tools	Koroška
Electrical/optical	Gorenjska, Goriška, Zasavska, Ljubljana
IT technologies (incorporating two sub- systems)	Ljubljana
Automotive (incorporating four sub- systems)	Dolenjska, Goriška, Obalno kraška. Koroška, Savinjska
Domestic appliances	Savinjska, Notranjsko Kraška, Gorenjska
Construction	Zasavska, Savinjska, Dolenjska, Gorenjska, Goriška
Transport - logistics	Obalno Kraška, Notranjsko Kraška

The greatest interest in co-operation and joint company development amongst the innovative clusters could be discerned in the area of the electrical/optical industry. Their highly innovative abilities and their geographical concentration in Goriška, Gorenjska, Osrednja Slovenska and Zasavje point to ample cluster development potential. This cluster could supply the car, electrical household appliances, and even the aerospace industry (to a lesser extent the machine tools industry). In addition, companies working in the area of electrical equipment for vehicles reason that there would be a great potential for synergetic effects within the group itself under conditions of co-operation currently underexploited. The involvement of Slovenian system suppliers to the automotive industry and to manufacturers of household electrical appliances in international networks of innovation, as well as the presence of world class international companies in this field in Slovenia holds great promise for future innovative developments of the electrics/optics system.

The mapping exercise brought the following conclusions:

- Co-operation and networking among companies, as well as between companies, R&D institutions and support organisations is relatively weak in Slovenia. However, there is evidence of clustering in both production and knowledge that could form the basis for cluster development.

- Infrastructure needed to support cluster development is only beginning to emerge. Managers of companies already involved in clustering pointed to the

absence of support structures, specific knowledge and services, as well as appropriate instruments that could support and stimulate networking among firms.

- However, existing linkages and networking indicate the existence of localised clusters in at least sixteen industries in the fields of machine tools, electrical/optical, industrial process control equipment, domestic appliances, automotive, systems for the production of suctions units, textiles, wood processing, construction, transport, IT technologies, publishing, spa tourism, coast tourism and food processing.

- The most innovative clusters, with the greatest potential for future development, are in the machine tools, electrical/optical, automotive, domestic appliances, construction and transport industries.

Cluster policy

In March 2000, a review of the geographical concentrations of industries and an identification of potential clusters was carried out (Dermastia, 2000). Key research findings showed no "real" clusters in Slovenia due to weak links among potential cluster participants and the early stage of cluster development infrastructure. However, the fact that the research pointed to the existence of at least ten potential clusters had a significant influence on the original cluster policy concept. Instead of a uniform programme, the Ministry of Economy decided to adopt a wider package of measures to encourage co-operation and networking.

Slovenian cluster development policy pursued three objectives. The first objective was to encourage co-operation and networking among companies in order to strengthen individual and joint abilities to develop partnerships in different areas of business, as well as to intensify co-operation between companies and research and development institutions to promote innovation and technological development. For this purpose, the Ministry of Economy decided to co-finance joint projects carried out by at least three companies and at least one R&D institution in the area of technological improvements, product development, specialisation, supply chains, joint production and marketing. The second objective was to promote the development of clusters through increased investments in support infrastructure. This primarily entailed strengthening know-how, skills and expertise for cluster development, targeting people and institutions alike. A training programme was designed to improve cluster development and to develop a network of cluster promoters, co-ordinators and potential cluster managers. The third objective was to initiate the formation of clusters in practice. The following programmes have been set up to help meet these objectives.

Cluster Pilot Programme

In 2000, the Ministry of Economy launched a pilot programme of cluster development in the absence of concrete experiences, knowledge and available instruments in the field of cluster development in Slovenia. The pilot programme was planned for the duration of 2000-2003 with the aim of developing a systematic approach to cluster development, the promotion of the cluster concept, the acquisition of experience and the strengthening of cluster policy.

Slovenian Cluster Pilot Programme, 2000-2003

The Ministry of Economy invited groups of at least ten companies forming value systems together with at least three support institutions qualifying as potential cluster cores to develop a common vision for the future in collaboration with the Ministry. From an open call for tenders, three pilot projects were selected. In total, six groups applied, from which the Ministry selected the automotive, the transport and logistics and the machine tooling applicants as cluster pilot projects. The choice of pilot projects was guided by criteria such as geographical concentration of companies, access to international markets in high value-added market segments, existing co-operation and networking among companies and research and development institutions, the existence of support organisations and the reputation of key companies in the respective groups. The assessment of the potential for success of the individual projects was also a very important criterion. Benchmarks utilised for assessing potential for success were: commitment of those participating; a critical mass of skills, knowledge and know-how; organisational and financial capabilities required for project implementation. Selected pilot projects subsequently prepared a strategy of cluster development and an action plan for it implementation.

At the outset, the three chosen pilot projects in the Slovenian Cluster Pilot Programme involved similar numbers of companies, albeit with differing characteristics. While the **automotive** and **transport** clusters are more national in orientation, the **machine tool** manufacturing cluster is strongly regional in focus (region of Savinjska, Eastern Slovenia).

- The automotive cluster comprises the most important Slovenian suppliers for the national vehicle industry. The majority of these companies was active on the international market, but only two were component suppliers for original vehicle manufacturers. Many of these companies have a sufficiently strong base of local suppliers.

- Luka Koper (port of Koper) and two other large companies whose activities are tied to the port and which complement Luka Koper's activities form the core of the transport cluster. Around these companies, a cluster of smaller firms displays a high level of mutual competition.

- In some respects, the machine tool manufacturing grouping showed the strongest cluster development potential, due to joint programmes developed at the beginning of the 1990s and the founding of a joint research and development centre. The cluster consists of tool manufacturers attracting buyers from the car and household appliances industry, as well as to a lesser extent from the telecommunications and aircraft industry. While the vision and objectives of the automotive industry and transport clusters were less well defined at the beginning, the objectives of the machine tools cluster were clear: to jointly develop new technologies and promote innovation in order to increase market share.

In 2001, all three clusters redefined and/or upgraded their proposed cluster strategies and drew up detailed action plans for further cluster development in 2002 and 2003. While the automotive and tooling clusters oriented themselves towards creating operating conditions for promoting innovation and technological progress, including the development of local supplier networks, the transport cluster chose a different approach. Given the high level of competition among the companies involved, a first phase was dedicated to formulating a joint vision and marketing on the basis of a critical mass of assets, knowledge and skills.

In 2002, the pilot projects began to implement their cluster strategy in line with their action plans. Preliminary results indicated that they had shifted to a phase of intensive growth, both in terms of a rise in the number of project participants and in terms of intensification of joint activities. All three pilot projects secured premises and acquired the necessary communications equipment. They also formalised the organisational preconditions for successful cluster development, including the appointment of cluster managers and support personnel. The pilot projects were completed by the end of 2003. Lessons learned, particularly at this final stage, provided guidelines to the Ministry for encouraging the internationalisation of Slovenian cluster systems.

The Cluster Pilot Programme has shown that policy to support clusters needs to promote a process of continuously ongoing communication, at all levels (engaging executive management, general management, R&D personnel and technicians) and among all actors (encompassing companies, institutions, as well as support organisations). It also needs to promote active co-operation between companies and agents of knowledge, the development of a system of planning, implementing and monitoring joint projects and active participation in international cluster networks. Furthermore, the development of a cluster exemplifies a common strategic vision and policy of all cluster participants. This requires the active participation of top level management. Motivation and the identification of joint objectives are

probably the most important aspects in cluster building projects, demanding a series of workshops as well as bilateral and joint meetings. The effectiveness of these activities can be increased if project management of the development of structural networks and clusters is entrusted to outside independent experts.

Training, the expansion of knowledge of the cluster concept and the creation of project groups in strategic areas of cluster development are vital. Another insight is the nature of cluster development as an investment in the future entailing the creation of a web of human relations based on parallel co-operation and co-ordination. Cluster development is costly, as it requires major engagements on the part of key personnel of participating firms, specific knowledge and skills, technical resources and thus financial investments.

Financial support to cluster initiatives

Based on the experience of the pilot project, in 2002 the Slovenian Ministry of Economy designed measures to financially support cluster initiatives. In a first step, the Ministry co-financed activities connected with defining a cluster's internal organisation and communications, as well as a joint strategy for cluster development. Companies together with support institutions could compete in tenders to benefit from a maximum EUR 70,000 per cluster development project. In a second step, the Ministry supported activities to implement cluster strategies that had been defined, particularly the development of joint business and innovative platforms, the execution of joint R&D programmes and preparation for participating in international networks. The target users were groups of at least ten companies and three support institutions. In 2002, a second tender for cluster development projects was called, bringing forward fifteen proposals for new initiatives out of which eight new initiatives were selected.

Local networks and clusters programme

In 2002, the Ministry of Economy implemented a separate programme aimed at developing local networks and clusters. This programme targets small companies (up to 50 employees) with a limited geographic scope. The idea was to support the most vulnerable sector of the Slovenian economy in the process of EU accession and to start building local networks to strengthen regional and national clusters from below. The programme entailed the identification of potential local networks and clusters, as well as an investment in the knowledge, skills and expertise needed by potential cluster managers to promote the development and functioning of local clusters. In a subsequent phase a friendly environment for local networks and clusters will be created in specific locations by promoting links between

micro- and small businesses at the local level. A network of brokers and co-ordinators will create a sense of common enterprise and help improve small businesses' access to financial resources. Some of the activities are carried out in conjunction with other ministries. Analysis of potential local clusters comprising at least three micro companies with up to 50 employees has revealed a potential for more than 50 local networks.

Results of cluster policy 2000-2002

The results of Slovenia's cluster development policy from 2000 to 2002 have been very encouraging: Three pilot clusters have been set up and are running. Eight more initiatives for cluster development involving 158 companies, 43 institutions and almost 41,000 employees have manifested themselves. 139 cluster projects involving 586 companies and 53 research and development institutions, including the universities of Ljubljana and Maribor are currently under way. A network of cluster development promoters and facilitators has been initiated helping companies to develop joint visions and joint projects. The role of cluster development promoters lies primarily in the promotion of linkage and co-operation among companies.

Policy developments in 2003-2006

For the period from 2003 to 2006, the cluster development policy has been upgraded with clear objectives, programme guidelines and targets. Sixteen national and regional as well as up to 25 local clusters are to be established. Cluster development is to be furthered by setting up centres of excellence, transport, logistics and technology, as well as business zones and labour market development measures. The Ministry estimates that by 2006, with successful implementation of the cluster development policy outlined above, the critical mass of links and networking necessary for promoting innovation and thus international competitiveness of the Slovenian economy could be reached.

In the overall process of cluster development, the role of the government in general, and the Ministry of Economy in particular is that of a catalyst. By promoting the transfer of key knowledge to the business sector, cluster development acts as an agent for permanent change via the effective adaptation of the economy to the dynamic environment of global competition and new technologies.

The approach is both strategic and dynamic. Strategic because it allows companies to master know-how and skills to operate under conditions of global competition and rapid technology change. Dynamic in that the state supports cluster development based on firm strategies, helping to overcome

significant obstacles to cluster formation and by encouraging the exchange of experience both nationally and internationally. The Cluster Development Programme is implemented and monitored by the Ministry of the Economy. The local cluster development programme is implemented by the Small Business Promotion Centre under the auspices of the Ministry of Economy. In both cases, companies are the main drivers in the clustering process.

Cluster development in Slovenia is guided by the bottom-up approach and by the principle of learning by doing. This allows constant adaptation of existing measures and the creation of new policy instruments to match actual cluster developmental phases. However, cluster policy cannot replace market mechanisms. Initiative and the responsibility for companies' performance are the domain of managers and employees alone who have assessed that clusters can significantly promote the competitiveness of individual elements and groups as a whole. For this reason, the management, organisation and direction of cluster development remain the independent responsibility of the companies and institutions involved.

At the time of writing, the Ministry of Economy is responsible both for the formulation, as well as for the implementation and supervision of the Slovenian cluster development policy. The encouraging results show that it was correct to opt for a strategy of incremental development of the cluster policy itself, to chose a phase-by-phase approach for the implementation of cluster development and to rely on the gradual establishment of the right institutional environment. Below is the current list of actors of cluster development and their areas of co-operation.

The anticipated acceleration in the development of clusters between 2003 and 2006 requires the creation of integrated, co-ordinated institutional structures that will not only encourage, but also effectively support private sector initiatives while at the same time reinforcing the long-term character of cluster development. This approach requires constant review of policy, the permanent introduction of new measures and instruments, and their implementation.

Table 3.4 Actors of cluster development

Area	Actors
Business environment	Companies, particularly from potential cluster companies in the pilot projects. Representatives of Chambers of Commerce.
Knowledge infrastructure	Three universities (Ljubljana, Maribor and Primorska); GEA College, International Conference on Data Engineering Bled. 360 developmental organisations, including 66 public institutions (including faculties), 204 companies, 19 private researchers, approximately 8,000 registered researchers. Technological centres.
Governmental bodies	Ministry of Economy, Ministry of Labour, Family and Social Affairs, Ministry of Education, Science and Sport, Ministry of the Information Society, Ministry of Agriculture, Forestry and Food, Ministry of Defence, Ministry of Transport.
Analysis and study	Faculty of Economics, Ljubljana, Central & Eastern Europe Privatization Network (CEEPN), Faculty of Economics and Business, Maribor, Faculty of Social Sciences, Institute of Economic Research, Ljubljana, Economics Institute at the Faculty of Law, Ljubljana.
Intermediaries with potential for active involvement	Technology Agency (to be established), Small Business Development Centre, National/ Regional Development Agency, Chambers of Commerce and Industry, Slovenian Trade and Investment Promotion Agency (TIPO), 48 local development centres, 12 regional development centres, technology parks financial institutions / banks.
Promotion and advisory capacity	Technology and Innovation Agency (to be established), Small Business Development Centre (SBDC), National Regional Development Agency (and 12 centres), advisory organisations, promoters, agents of development.
Implementation of incentives	Technology and Innovation Agency (to be established), institutionalised clusters, SBDC.

For this, institutional agents of cluster development must master a wide spectrum of knowledge, skills and expertise in different areas (programming, project management, social development concepts, industrial policy, company development concepts, etc.). Cluster development being an extremely wide subject, the establishment of an effective structure of policy implementation and the strengthening of requisite knowledge and skills held by all actors are among the Ministry of Economy's main priorities for the 2003 to 2006 period.

Additional agencies supporting cluster policy

Small Business Development Centre

In addition to the Ministry of Economy, an important role in promoting cluster development in Slovenia was played in 2002 by the Small Business Development Centre (SBDC). The Small Business Development Centre is a public institution established by the government in 1992 to co-ordinate the

activities of the small business support network. It is responsible for the implementation of SME strategy and also for the implementation of the second pillar (entrepreneurship promotion) of the government's employment action programme, which was developed by the Ministry of Labour, Family, and Social Affairs. Within this programme the SBDC, together with the small business support network and its partners, will be in primary charge of meeting objectives in the development of entrepreneurial culture, the simplification of procedures and overhead costs related thereto, the promotion of self-employment and development of small businesses, and the development of employment opportunities within the framework of local employment initiatives. There are two Euro Info Centres, one in Ljubljana under the aegis of the Chamber of Commerce and Industry, and another under the aegis of the SBDC. Through its network, the SBDC supplies an average of 10,000 different services a year to entrepreneurs. As the implementation agency of the Ministry of Economy responsible for promoting small businesses, entrepreneurship and self-employment, and fostering a culture of enterprise, the SBDC has taken on the task of identifying potential local clusters that is clusters of micro companies (up to 50 employees), while training promoters, agents of development and potential cluster managers.

Chambers of Commerce and Industry

The Chamber of Commerce and Industry and the Chamber of Small Business provide support to SMEs through their network of 13 regional Chambers of Commerce and 62 regional Chambers of Small Business. The Chamber of Commerce and Industry is responsible for providing assistance to medium-size businesses with more than 50 employees and businesses involved in high-tech, manufacturing, trading and services. The Chamber of Small Business limits itself to the activities of small businesses. The network of business support services mainly provides two kinds of measures for SMEs, on the basis of a voucher system: Hard measures (financial support and premises for incubators and consulting services, training, etc.) and soft measures such as consulting and advice.

The role of the Chamber of Commerce and Industry in the development of clusters has to date been marginal. The Chamber was involved in the development of the pilot projects, primarily by providing suitable premises for holding workshops and seminars. The Chamber of Small Business has not yet participated in the development of clusters in Slovenia. The potential and capacity of the Chamber of Commerce and Industry and the Chamber of Small Business to support the development of clusters are certainly substantial. They could organise the joint appearance of cluster firms at fairs, include information on clusters in their promotional material and

participate in activities linked to specific clusters. In addition, the government has also co-founded regional entrepreneurship centres, which are not incorporated into the small business development network. These centres have the basic purpose of decentralising promotion and development activities, developing programmes and ensuring that co-ordination among local centres is more effective.

Technology agency

The creation and launch of a technology agency is envisaged for 2003. The Technology Agency will become key in implementing technological change actively participating in cluster development. It will act as a key promoter of innovation to enhance the economy's competitiveness. The Technology Agency will have a stake in the development of technologically advanced clusters promoting integration in and links among technological centres and technology parks.

International links

Slovenian clusters are primarily developing according to the concept of dynamic concentric circles, the car industry cluster and the tool manufacturing cluster being good examples (Jaklič, 2002). Leading companies, mostly large, establish themselves and develop relations with smaller companies grouping around them, themselves more equal in size. Those cluster core companies normally have access to international markets and often act as developmental suppliers of complex products and as suppliers of system solutions for demanding customers abroad. In Slovenia, those leading companies are mostly positioned as end customers for products in a vertical production chain. Through their local supply chains, the cluster core companies can reap high-quality product inputs for themselves while SMEs can strengthen their own competitive advantage as suppliers of high quality and gain access to international markets as part of a production chain.

Companies in this structure pursue different interests; SMEs primarily expect to obtain competitive advantages based on synergistic effects, and thus access to international markets. They are mainly interested in co-operation in focused areas such as procurement, marketing, production, research and development, and less in the development of cluster infrastructure. Larger companies for their part are oriented towards promoting innovation. This requires support for more remote circles of smaller companies strengthening their independent functioning and assisting them with incorporation into other, including international, networks. However, the readiness of leading companies to take these steps is relatively

low. The conflicts of interest that arise promote a vicious circle of insufficient engagement on the part of the senior management in the development of the cluster itself and an inability to bring about specific commercial projects that would be generated and realised thanks to the cluster. An additional obstacle is the overburdening of leading companies with activities that decisively exceed their core competencies and the desire of smaller companies to always incorporate new lines of business into their operations.

In contrast to other post-socialist countries, Slovenia was not among the key destinations for foreign direct investment. The underlying reasons transgress the scope of this paper, but the less significant level of investment by sophisticated customers is perhaps one of the biggest challenges facing the development of Slovenian clusters.

On the other hand, the absence of this type of "end" customers for Slovenian companies' products reduces the risk of Slovenian companies positioning themselves in the lower parts of the value chain. The constant demonstration of capabilities and the search for markets and market niches does not merely entail cost control for companies, but above all leads to the permanent promotion of innovation. This requires the constant upgrading of skills and knowledge of the technological base in the industries in which they operate.

Furthermore, the most promising Slovenian clusters (machine tool manufacturing and the automotive industry) show that Slovenia has highly developed technological capabilities and great potential to become a partner not only for key product customers but also to those developing next-generation technologies. Highly specialised supplier chains are developing inside these clusters, and the process of outsourcing parts of the value chain with lower added value to regions with lower labour costs (particularly elsewhere in the former Yugoslavia) has begun. Thus the first spin-offs from the operation of clusters are springing up.

The central challenge in the internationalisation of Slovenian clusters is to move from simple integration into international production chains towards an active involvement in international networks of innovation. There are undoubtedly opportunities for further development through international co-operation and linkages among clusters and other network structures.

Areas for improvement

On the basis of all the findings reported above, three areas for improvement can be identified: (i) increased inter-ministerial and public-

private co-operation; (ii) definition of new measures, incentives and instruments for developing existing clusters and creating new ones; and (iii) the development of local support infrastructure to promote clustering.

Inter-ministerial and public-private co-operation

Support for clusters does not necessarily entail an increase in direct financial resources for individual clusters, but primarily a more active participation of all ministries in cluster development and the promotion of public-private partnerships. The decision to orient the first phase of the Slovenian Cluster Development Programme towards co-operation, linkage and networking was certainly one of the key success factors behind cluster development in Slovenia. However, it should be pointed out that clustering is not merely co-operation and networking, it consists of all elements fostering cluster development, such as the attraction of sophisticated partners into a cluster, FDI promotion, education and.training, the creation of information and other infrastructure links, the building of environmental protection systems and the encouragement of research and development. It also encompasses the provision of services adapted to the needs of cluster companies, such as the acquisition and joint use of information, the issuing of certificates, joint testing, the promotion of a common design, as well as the provision of logistical support. Other elements of crucial importance are support in the search for and hiring of suitable personnel, activities to encourage the internationalisation of companies in a cluster, assistance in the development of technological networks, as well as the promotion of start-ups and the provision of risk capital. Because many of the crucial elements of cluster development lie outside the realm of the Ministry of Economy's powers and responsibilities, the first policy recommendation would be the development of an inter-ministerial public-private policy group aimed at supporting cluster development in Slovenia.

The development of an inter-ministerial public-private policy group requires an intensification of networking among key people to underline the partnership between the government, ministries, companies and other agents of cluster development. An attitude of partnership can provide significant support when drawing up common guidelines for cluster development. Partnership can develop simultaneously at three levels: at the government level, at the level of the Ministry of Economy, and at the operational level of implementing cluster development policy.

- At the government level, a strategy council on microeconomics could be formed, in which key government representatives would participate (Jaklič, 2002). The council would serve as a basis for co-ordination among ministries and between business and the

government. It would be regularly updated on the development of strategic cluster guidelines.

- The level of the Ministry of Economics could see the creation of a programme council for cluster development, on which all agents of cluster development such as companies, institutions and organisations would be represented. This would ensure constant monitoring of cluster development and guarantee the entry of fresh ideas into cluster development policy itself.

- At the operational level the effectiveness of implementing cluster policies could be increased by evaluating cluster developments each year and by negotiating common programme guidelines. For the evaluation of cluster programmes, it would be worth creating a commission consisting of independent Slovenian and foreign experts, representatives of the Ministry of Economy and representatives of companies involved in clusters. Negotiation would contribute to overcoming the bureaucratic attitude of take it or leave it, and facilitate a higher-quality selection of a smaller number of projects, thus concentrating resources on the priorities of individual clusters. Expertise in the microeconomic council, the programme council and the evaluation group could be further supported by an international expert group providing assessments of Slovenian cluster developments tapping into knowledge and experience of cluster development abroad.

Definition of new measures, incentives and instruments

Recommendations regarding new measures, incentives and instruments for the development of existing clusters and the creation of new clusters proceed primarily from the "dynamic concentric circles" model of cluster development in Slovenia. The current vicious circle of insufficient engagement by management and scarce commercial projects can be broken by more intensive, substance-oriented networking among cluster participants at different decision-making levels and by adapting existing policy measures to developing clusters. Improved networking by senior management would generate network opportunities, such as opening doors to key customers and establishing constructive dialogue with various ministries, chambers of commerce and industry and development institutions, and support the creation of joint policies and activities by companies in Slovenia and abroad. Networking of executive management would also encourage the development of partnerships at the level of commercial activities (financing, joint marketing, establishment of sales channels, development of technologies, strengthening of assets and resources). Networking among research and development personnel would accelerate the development of

new technologies and products and the creation of commercial opportunities.

The state can enhance the dynamic concentric cluster circles by helping companies to gain competitive capabilities and the capacity to function more independently in network structures of a local, national and international nature. Measures, such as the development of local small business networks, encouragement of linkage and specialisation within supplier chains and promotion of SME internationalisation already exist. It therefore looks fitting for the state to focus primarily on more intensive promotion of linkage, co-operation and networking as a key factor of success in the global economy, as well as on competitiveness policy and SME programmes. New measures of cluster development should be aimed at two areas. The first includes meta-projects by cluster participants. Such projects would forge concrete links among the senior management of at least the key agents of cluster development, and would have an impact both inside and outside Slovenia. However, such projects must be selected on the basis of the aforementioned technical negotiations, and state support should be clearly tied to the objectives and results of the project being achieved. The second area entails encouragement for cluster core companies to form spin-offs. This process would not only bring about an increase in efficiency, but would in particular facilitate the creation of new companies as a basis for geographically concentrated clusters.

Slovenia has an open economy, so the immediate incorporation of an international aspect in strategies of cluster development is urgently required. Clusters being by definition local in nature, their "internationalisation" refers to the companies involved in the cluster itself. State measures in the area of cluster internationalisation should thus be primarily aimed at creating favourable export conditions for all companies, in line with their competitive advantages and capabilities, and on the principle of combining different measures for promoting exports, from concluding agreements to seeking synergy among different institutions and organisations at the national and international level. The state can support the internationalisation of clusters through promotional activities in the form of international conferences and seminars, by opening doors to key sophisticated customers for clusters, and above all, by promoting Slovenia as a partner for the most advanced developers of new technologies. Effective promotion requires the construction of support infrastructure and a diplomatic network that would operate on the principle of responding to the needs of the economy, flexibility and cost-effectiveness.

Local support infrastructure to promote clustering

As clusters are by definition local in nature, it is recommended to focus on establishing a local support infrastructure for existing and emerging clusters. State support should be aimed at setting up a network of local cluster offices to assist the development of local networks of micro and small businesses. Its role would be to accelerate networking among companies at the local level, to assist in identifying and realising joint opportunities for groups of companies, and to co-ordinate the functioning of individual local networks. The co-ordination of these local cluster offices could be taken over by any of the existing agencies at the Ministry of Economy. The Technology Agency is expected to become a key agent in the implementation of programmes promoting technological change. It could become responsible for implementing cluster meta-projects and technological programmes for advanced Slovenian clusters.

Bibliography

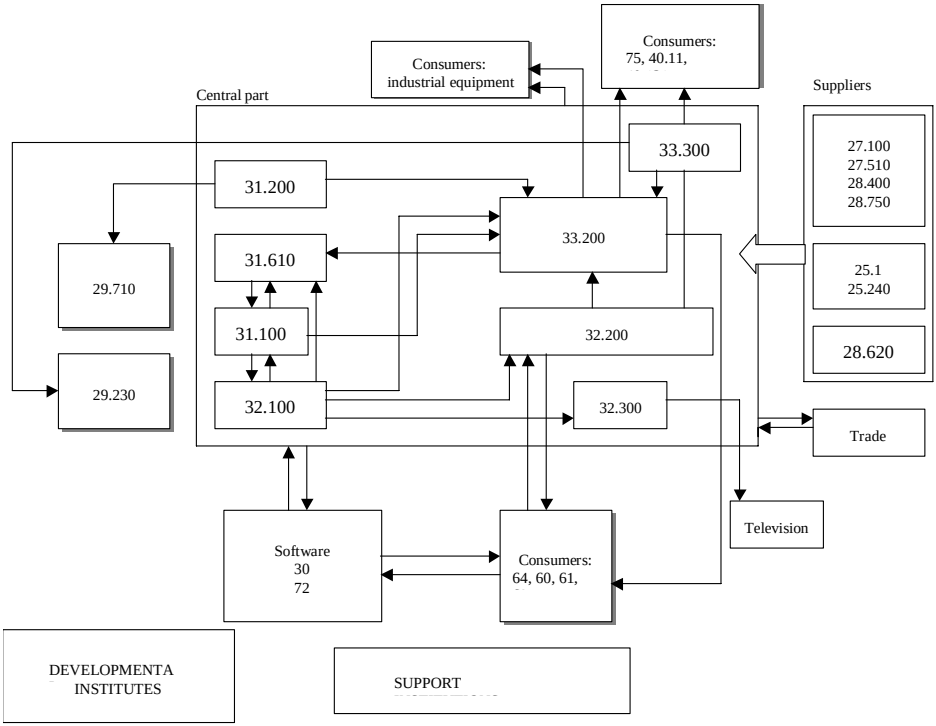
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ANNEX 3.A.

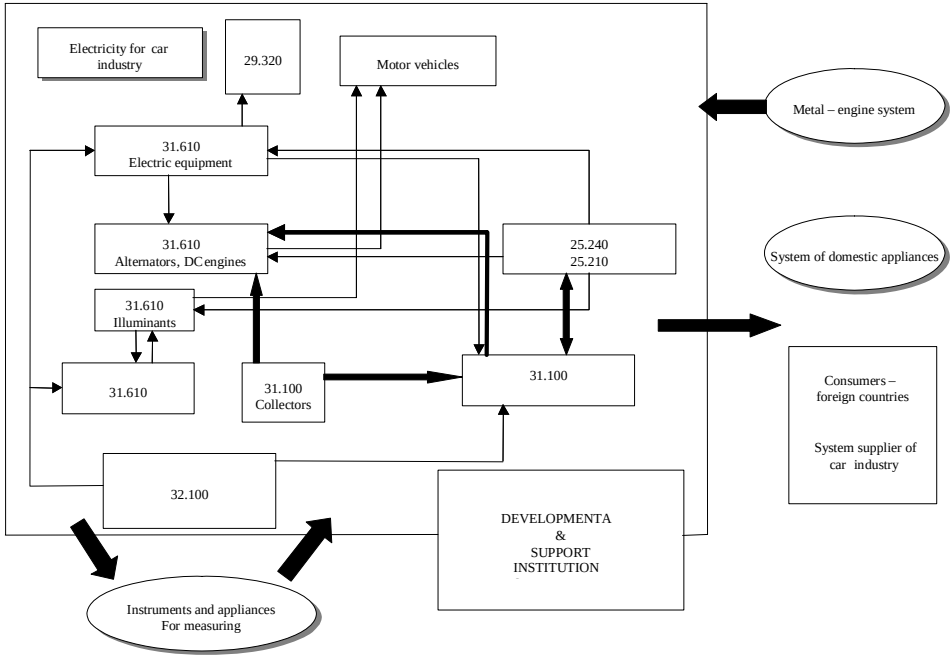
CLUSTER MAPS

Electrical – optical production services system (Gorenjska, Goriska, Zsavaska, Llubjlana)



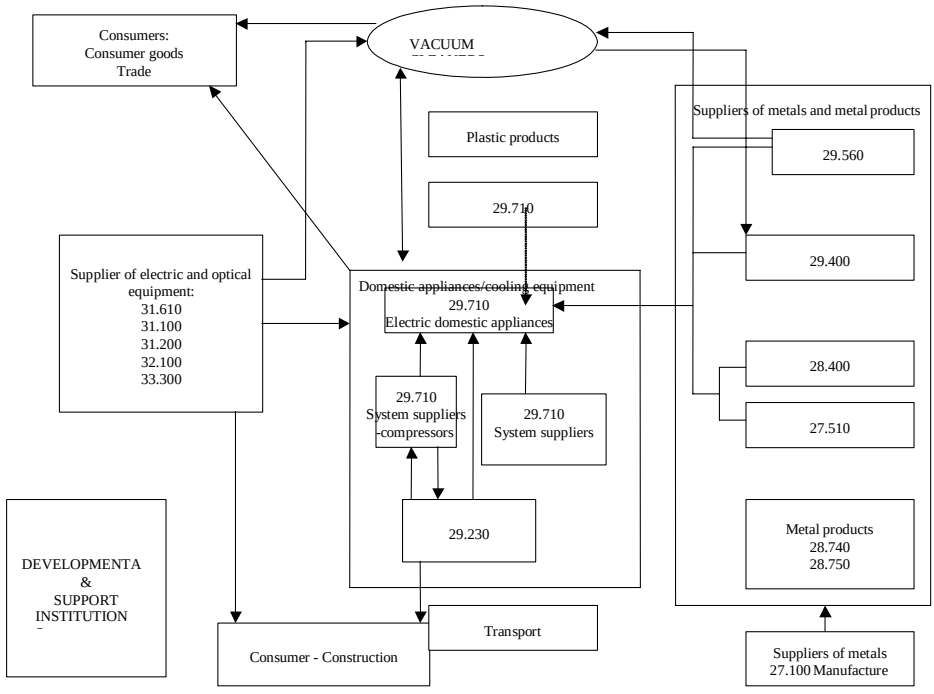
30	Manufacture of office machinery & computers
72	
25.240	Manufacture of other plastic products
27.100	Manufacture of basic iron and steel and of ferro – alloys
27.510	Casting of iron
28.400	Forging, pressing, stamping & roll forming of metal, powder metallurgy
28.620	Manufacture of tools
28.750	Manufacture of other fabricated metal products nec
29.230	Manufacture of non-domestic cooling and ventilation equipment
29.710	Manufacture of electric domestic appliances
31.100	Manufacture of electric motors, generators and transformers
31.200	Manufacture of electricity distribution and control apparatus
31.610	Manufacture of electrical equipment for engines and vehicles nec
32.100	Manufacture of electronic valves & tubes & other electronic components
32.200	Manufacture of TV & radio transmitters & line telephony & telegraphy
32.300	Manufacture of TV & radio receivers, sound or video etc apparatus
33.200	Manufacture of instruments & appliances for measuring etc
33.300	Manufacture of industrial process control equipment
25.1	Manufacture of rubber products

Electrical equipment for vehicles (Goriska)



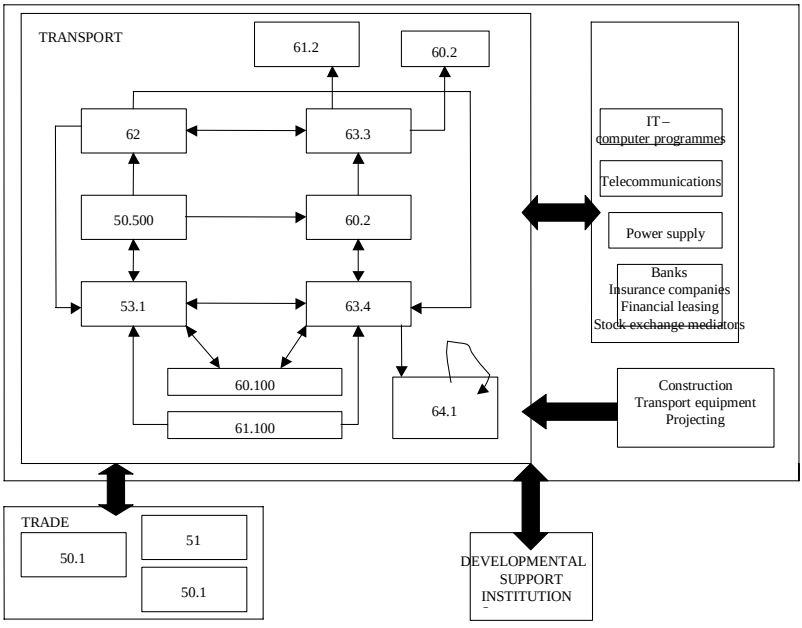
25.210	Manufacture of plastic plates, sheets, tubes and profiles
25.240	Manufacture of other plastic products
29.320	Manufacture of other agricultural and forestry machinery
31.100	Manufacture of electric motors, generators and transformers
31.610	Manufacture of electrical equipment for engines and vehicles nec
32.100	Manufacture of electronic valves & tubes & other electronic components
35	Manufacture of other transport equipment

Domestic appliances production services system (Savinjska, Notranjsko Kraska, Gorenjska)



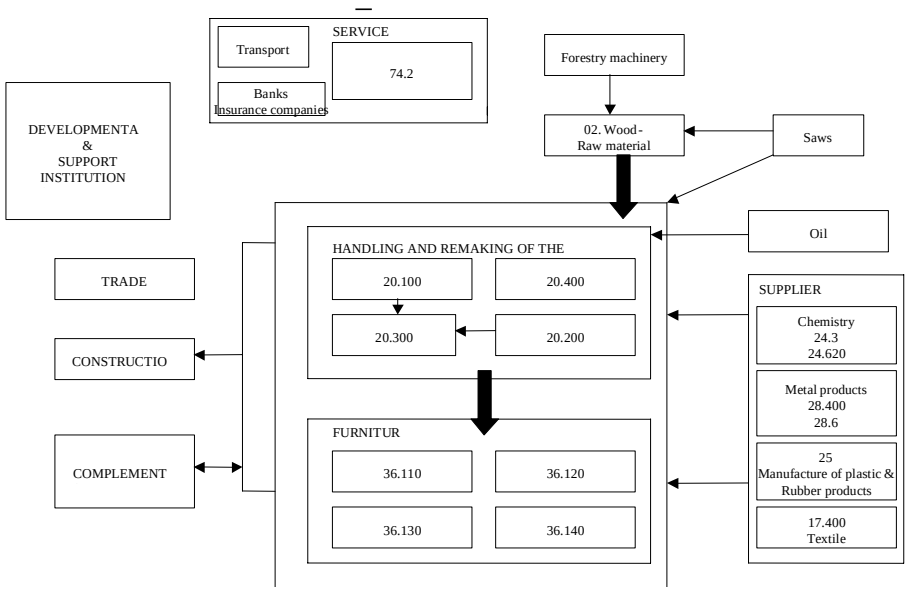
27.100	Manufacture of basic iron and steel and of ferro-alloys
27.510	Casting of iron
28.400	Forging, pressing, stamping & roll forming of metal; powder metallurgy
28.740	Manufacture of fasteners, screw machine products, chain and springs
28.750	Manufacture of other fabricated metal products nec
29.230	Manufacture of non-domestic cooling and ventilation equipment
29.400	Manufacture of machine tools
29.560	Manufacture of other special purpose machinery nec
29.710	Manufacture of electric domestic appliances
31.100	Manufacture of electric motors, generators and transformers
31.200	Manufacture of electricity distribution and control apparatus
31.610	Manufacture of electrical equipment for engines and vehicles nec
32.100	Manufacture of electronic valves & tubes & other electronic components
33.300	Manufacture of industrial process control equipment

Transport logistic system (Obalno Kraska, Notranjsko Kraska)



51	Wholesale trade, commission trade; except of motor vehicles &cycles
62	Air transport
50.500	Retail sale of automotive fuel
60.100	Transport via railways
61.100	Sea and coastal water transport
50.1	Sale of motor vehicles
60.2	Other land transport
61.2	Inland water transport
63.1	Cargo handling and storage
63.3	Activities of travel agencies & tour operators; tourist assistance nec
63.4	Activities of other transport agencies
64.1	Post and courier activities

Wood – furniture production services system (Notranjsko Kraska, Gorenjska)



2	Forestry, logging and related service activities
25	
20.100	Sawmilling and planing of wood, impregnation of wood
20.200	Manufacture of veneer sheets; plywood, laminboard, particle board, etc
20.300	Manufacture of builders' carpentry and joinery
20.400	Manufacture of wooden containers
24.620	Manufacture of glues and gelatines
28.400	Forging, pressing, stamping & roll forming of metal; powder metallurgy
36.110	Manufacture of chairs and seats
36.120	Manufacture of other office and shop furniture
36.130	Manufacture of other kitchen furniture
36.140	Manufacture of other furniture
24.3	Manufacture of paints, varnishes, printing ink and mastics
28.6	Manufacture of cutlery, tools and general hardware
74.2	Architectural & engineering activities & related technical consultancy

Chapter 4

Slovakia

by Martin Sirak and Stefan Rehak

The Slovak cluster chapter assesses whether the break-up of long-standing industrial structures has led to the rapid appearance of new industry clusters in Slovakia and whether a link exists between those new regional industry clusters and foreign direct investment. Four selected "sectoral clusters" (automotive, electronics, chemicals and clothing) are then introduced in more detail to understand the location and clustering behaviour of firms within their national and regional economies. Finally, Slovak clusters are assessed in an international perspective, with special attention paid to the Bratislava-Vienna border region.[5]

Local cluster mapping methodology

The working definition of clusters adopted for the cluster mapping is in line with the OECD definition 'local concentrations of horizontally or vertically linked firms that specialise in related lines of business together with supporting organisations'.

The cluster mapping exercise commenced with location quotient analysis. The latest available industrial data for Slovak manufacturing were compiled and analysed at the territorial level. The data used were for NACE 10-37 manufacturing as reported by Slovak Statistical Office in its 2001 Yearbook of Industry. Those manufacturing industries with an LQ higher than 1 and employment of more than 2000 were identified as potential *"regional industry clusters"* - there are 46 of them, with two to eight per NUTS2 region. However, it remains an open question how many of these "spatial concentrations" represent genuine "clusters", because geographical concencentration does not necessarily imply that input-output linkages are functioning, or being exploited in a way that enhances the performance of the constituent industries.

In a second stage of analysis, questionnaire and case study evidence was collected. An extensive questionnaire was mailed to a sample of 250 manufacturing firms (177 firms responded). Subsequently, some 54 field interviews were carried out to add depth to the mail survey work (e.g. questions concerning firm strategies, and perception of local competition/cooperation). The overall aim was to produce a rough picture

of the interaction between industrial location and regional competitiveness within a global economic setting, which could then serve as a checklist for regional policy planners in Slovakia. In addition, case study work focused on four selected "sectoral clusters" (automotive, electronics, chemicals and clothing).

The clusters

Figure 4.1 below summarises the results of the cluster mapping exercise based on location quotient (LQ) analysis. The numbers in brackets denote the value of the location quotient and the size of regional employment of a given industry. Further information on each of the concentrations, incorporating information from the company surveys, is provided in the following paragraphs.

Textiles and clothing

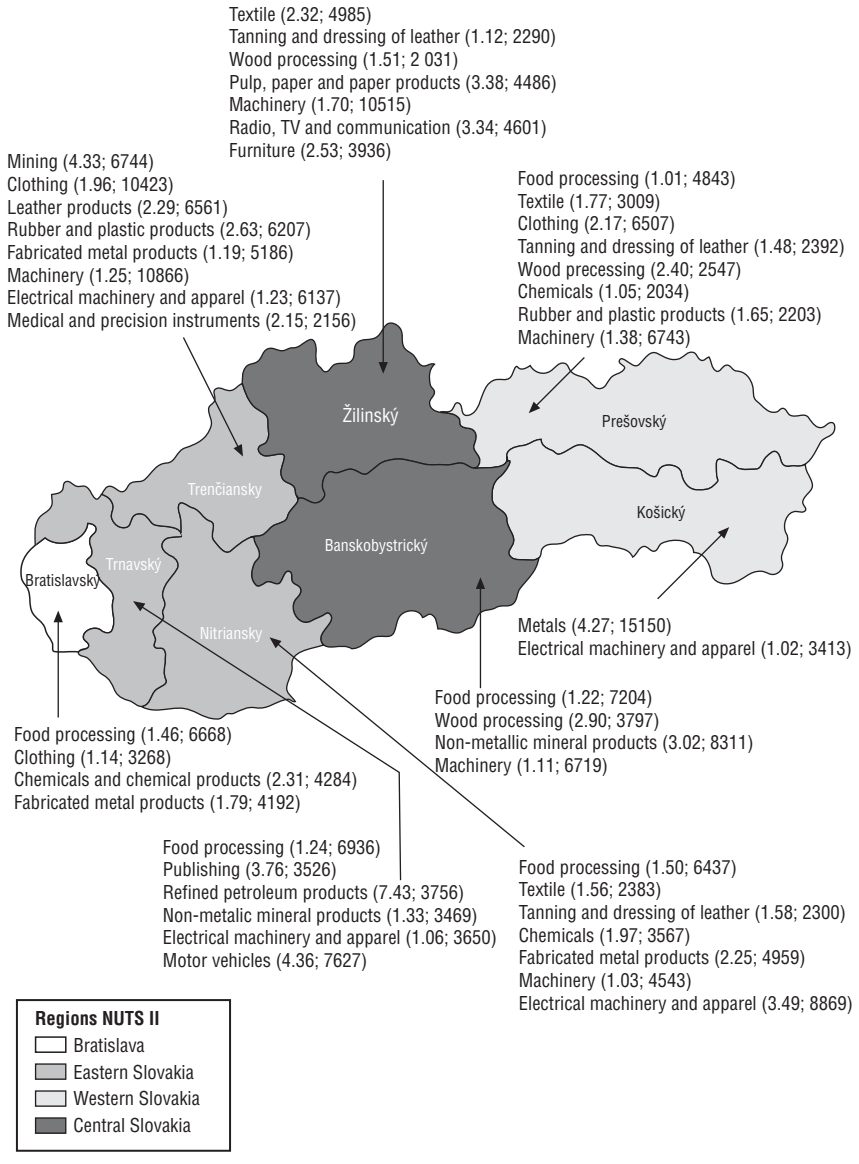
Textile production is concentrated in the regions of Zilina (30.2 percent of employment), Presov (18.2 percent) and Nitra (14.4 percent).

The clothing industry is concentrated in the Trencin region (36 percent of total employment) and Presov region (22.4 percent). Trencin is home to the two largest clothing companies in Slovakia, each with around 3,000 employees. Most of the production is exported (up to 70% to EU markets). In addition to these large companies there are about 670 firms in the clothing industry, mainly SMEs. Employment in the clothing industry stands at 14.3 percent of total industry employment in Presov (more than 6000 jobs in more than 100 registered local businesses).

Shoe making

The history of the shoe-making industry is linked to the famous entrepreneur Tomas Bata who established his shoe making company in the town of Partizanske (Trencin region) in the 1920s. After World War II, production grew rapidly and reached 37 million pairs of shoes a year at the end of 1980s, employing 11,000 workers. Loss of Eastern European and Soviet bloc (Council of Mutual Economic Assistance) markets after 1989 led to the significant loss of employment and production in indigenous companies.

Figure 4.1 Regional concentrations in manufacturing



However, there are now several large domestic and foreign shoe-making companies in the traditional location, co-located with smaller firms. In Partizanske and the neighbouring town of Banovce nad Bebravou, two large German companies - Gabor and Elefanten-Slowakei - have located their green-field investment projects,employing more than 2,000 people mainly

released from closed factories. Although the concentration of firms is evident, the relationship among firms and institutions is still in a process of formation. The existing Slovak Agency for Support of Leather and Shoe-making Industry (located in the region) does not seem to be working efficiently, and the local educational sector (technical schools), which supplies industry with skilled people currently lacks appropriate R&D capacity. As a result, the indigenous industry now has a very fragile (mainly cost-based) locational advantage vis-à-vis global competition, making it vulnerable to industry relocation in the near future.

Wood processing

Slovakia's wood processing industry is relatively independent from imports of raw material inputs. The industry is concentrated in the regions of Banska Bystrica (36.6 percent of the employment), Presov (24.6 percent) and Zilina (19.6 percent). The Banska Bystrica region is home to the most important wood processing companies located in Zvolen, Zarnovica and Banska Bystrica with related educational and other supporting institutions. However, the domestic production capacity of the industry is not sufficient, so large amounts of wood are being exported. Production capacities are to be expanded through a planned industrial park in Spisska Nova Ves. During transition years, the industry's employment was halved, but many companies which went bankrupt or were divested are now recovering their business. An example of a successful conversion is the Swiss brownfield investment into an important local wood-processing company Drevokombinat Saris: The Presov-based Kronospan company has quickly taken over the leading position within the industry.

Furniture

There are more than 100 companies in Slovakia and more than 7,000 self-employed people (producing more than 30 percent of output) in the furniture industry. The most important foreign investor is Sweedwood Slovakia (a daughter of IKEA established in mid-1993), currently running its production at three sites - Malacky (Bratislava region), Trnava (Western Slovakia) and Zavazna Poruba (Central Slovakia) employing about 1,600 people. The furniture industry is most concentrated in the Zilina region, where it accounts for 33 percent of total employment.

Pulp, paper and paper products

The production of pulp, paper and paper products is concentrated in the Zilina region, which has around 44% of the employment in this industry. The industry is undergoing major changes, decreasing its number of jobs, however with increasing revenues. The main Slovak producers have their

strategic foreign partners, and are being increasingly integrated in global production networks (the most visible and successful example being the key domestic player SCP Ruzomberok through a strategic Austrian investment by Neusiedler AG).

Printing and publishing

The printing and publishing "cluster" consists of a group of firms producing books, newspapers and journals. Around 45 percent of the total employment in this industry is located in the Bratislava region. Bratislava City is home to the biggest national magazines and papers, publishers and press agencies. The industry benefits from the supporting and related industries such as the media (radio and TV broadcasting), entertainment, advertisement agencies, photographers etc.

Mechanical engineering

Mechanical engineering used to be the dominant industrial sector in the former planned economy, both in terms of output and employment. Its emergence and historical development was determined by World War II and the subsequent Cold War years, and is thus closely linked to the location of the armaments industry in the "old" industrial regions of Povazska Bystrica and Dubnica nad Vahom. The highest localisation is reported in the regions of Trencin and Zilina, comprising together almost 43 percent of the total employment, with the share of regional industry employment being 13.9 percent in the former and 18.8 percent in the latter. The industry has also attracted major foreign investors (INA, Whirlpool, Lombardini, Sachs). Unfortunately, unclear ownership structures still hinder the development of this industry.

Electrical engineering and electronics

The recent growth in electrical engineering has made this branch an important pillar of Slovak industry. Privatisation has been completed, and the industry is currently represented by a large number of foreign inward investors (Delphi, Siemens, Molex, Osram). The substantial share of employment is located in the less developed regions of Nitra and Kosice, where production is based on cheap "blue-collar" work.

At the same time, production with higher value-added – radio, TV and communication (ie. electronics) – is growing substantially, attracting leading foreign investors (Sony, Matsushita, ON Semiconductors, Alcatel, Punch, Samsung). The north of Slovakia is home to much of the information and communications technology sector, and electronics. In particular, the Zilina region accounts for almost 44 percent of electronics industry employment in

Slovakia. A dramatic decline of output of the traditional TV-set producer TESLA due to transition recession and fierce global competition in eastern markets and losses in the domestic market have resulted in the break-up of the company. After complicated developments, a number of new companies were established and the skilled labour force has attracted Japanese and European investors. Although business relationships among the firms co-located in the region are still in the making, the firms surveyed agree that closer ties among competing companies would be instrumental for their future success.

Case study clusters

We now briefly report on four case studies, which document the processes of internationalisation and spatial clustering of the Slovak manufacturing industries today. They also illustrate the determining role of foreign direct investment, creating global production networks in which numerous domestic SMEs participate. The four manufacturing case studies include two high-technology (auto assembly/components and electronics) and two low-technology industries (chemicals and clothing).

Auto Assembly and Components

A special attention in our analysis is given to clustering and networking in the Slovak automotive industry which has become the leading sector of the national economy in recent years.

Auto Assembly: The Volkswagen success story

This company is both the largest foreign investor and exporter in Slovakia, steadily improving its performance, surpassing original expectations. In terms of key performance indicators like production, exports, profits, employment and investment, *Volkswagen Slovakia (VW)* is critical to the competitive position of the Slovak manufacturing sector. Currently anchored in the industrial complex outside Bratislava, VW has steadily been increasing its production over its 12-year history. Whilst in 1992, 10 to 15 cars were produced daily, in 2001 this was more than 600 cars daily (ie. about 225,000 annually) and the plans are to raise daily production to more than 1,000 cars.

Since 1999, VW Slovakia has been 100%-owned by VW Germany. The VW group also invested, together with Siemens, in the construction of a factory producing automotive electronics equipment in Nitra (Western Slovakia). A further expansion of the factory in Bratislava and a new manufacturing unit for gears in Martin (Central Slovakia) was realised. The decision of VW AG to increase its investment in Slovakia was motivated by

the fact that the factory in Bratislava is one of the most successful foreign plants of the VW group in the world. Thus, the first Dzurinda government decided in 1998 to support VW's investment projects in Martin and Nitra with EUR 5 million and non-financial support.

Auto components: Searching for opportunities in the global arena

The technical production capacity in VW Slovakia was set up for 1,800 to 1,900 cars a day. Further growth will depend on the production and innovative capacity of the approximately 150 automotive components suppliers in Slovakia. Consolidation and expansion in this sub-sector has been driven by the desire of suppliers to move up the value chain and demands by manufacturers for single source supply on a global basis. Suppliers are forced to continue searching for additional added value or cost reductions. The production of car components represents a substantial part of the Slovak industry. During the period 1997-2001, automotive component supplies in Slovakia gradually increased from approximately EUR 0.43 billion to 1 billion, whilst an increase from approximately EUR 0.78 billion to EUR 1.33 billion was achieved in the period 1999-2002. The most recent figures show that more than 40% of gross turnover in the automotive industry is generated by the producers of components, while the rest is generated by VW Slovakia alone. There are more than 60 Slovak components suppliers for VW car assembly in Bratislava. In addition, new models of VW have attracted its traditional first- and second-tier subcontractors, which have located in industrial parks across the Bratislava (e.g. Johnson Controls, Lear, Plastic Omnium) and Trnava (e.g. Delphi Automotive Systems, Sachs Slovakia) regions.

VW has recently announced plans to begin car assembly in Ukraine. This decision is an integral part of VW's strategy to expand in Central and Eastern Europe, not only in sales but also in production. This generates an enormous opportunity for Slovak subcontractors and for VW Slovakia, being the most eastern production location of the concern in Europe.

The automotive sector in Slovakia received a huge boost with the January 2003 announcement of plans by French auto giant *PSA Peugeot Citroen (PSA)* to locate its second Central European factory near the Western Slovak town of Trnava, with this investment project being comparable in certain respects to that of VW. According to the strategic plan, from 2006 they will start producing about 300,000 cars a year creating about 3,500 new jobs in assembly, with at least 3,500 more to be created in supplier industries, and investing up to €700 million. The main reasons for choosing Trnava location were declared to be its highly favourable geographical location, excellent road and rail connections, skilled labour

force, and the proximity to strategic markets, with the cheap local labour force not cited as a primary motivation.

VW and PSA are Europe's two largest carmakers. With planned capacity of 300,000 new cars annually, PSA's plant means that Slovakia's overall annual auto production could triple by the end of the decade. Undoubtedly, PSA's investment will spur growth in Slovakia's industrial parks through inward investment by foreign components suppliers and drive output increases at the country's automotive suppliers.

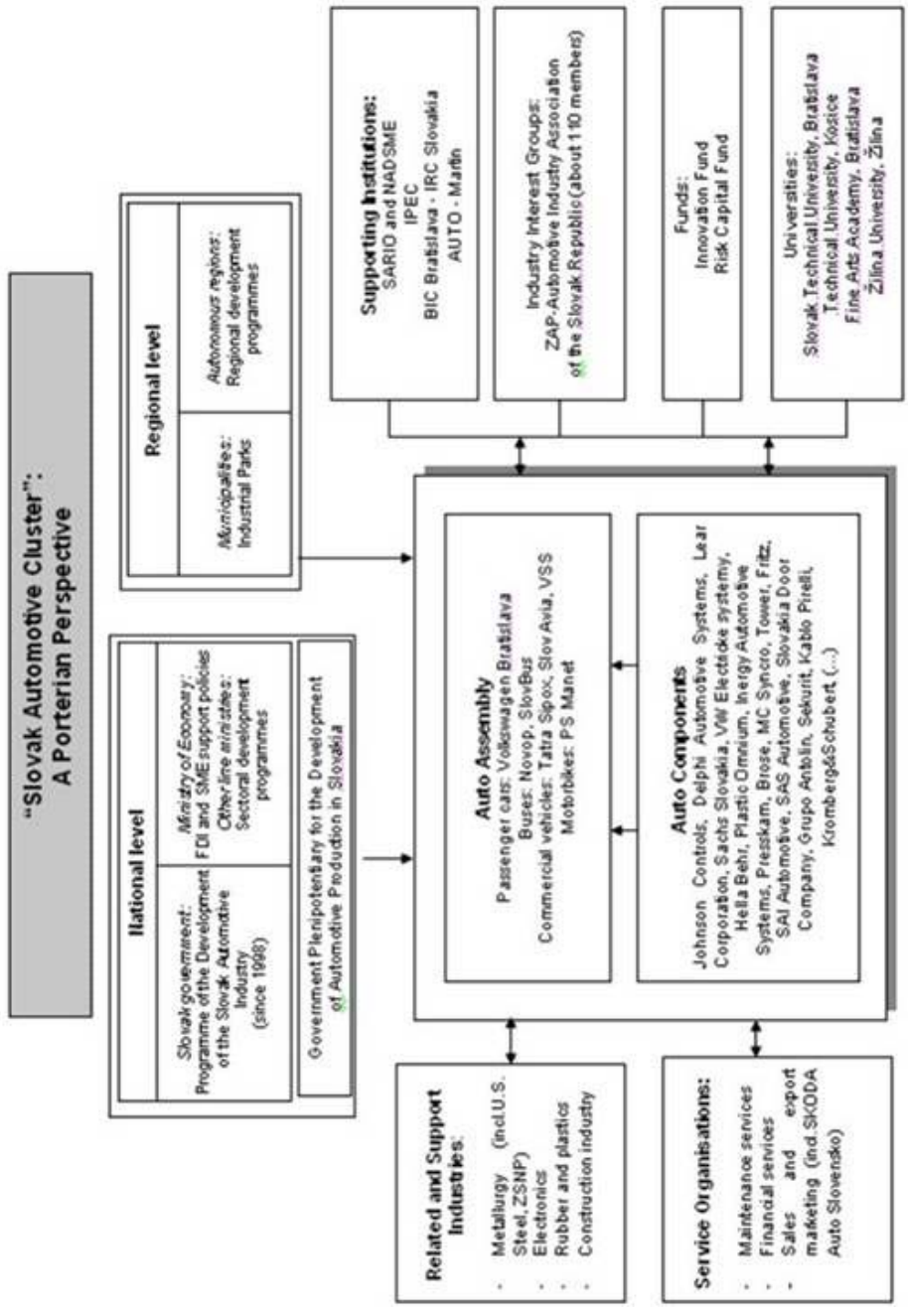
Figure 4.2 uses a Porterian perspective to show the main actors in the Slovak automotive cluster.

Electronics

Nationally, the electronics industry had never been of great significance during socialist times. However, it has since become a strategic sector in the local economy of Liptovsky Mikulas (Zilinsky kraj, Central Slovakia), partly based on conversion of previous defence production facilities.

FDI in electronics was very limited in early 1990s, the only significant investment of being one of EUR 5 million by the French-German partnership Alcatel SEL in the domestic telecommunications enterprise TESLA Liptovsky Hradok. *Alcatel SEL TLH* is seen as one of the success stories of the otherwise controversial defence sector conversion through FDI. It has introduced modern production methods and technologies, absorbed the former military sector labour force, reduced job losses and contributed to the upgrading of the country's telecommunications system. However, as noted by Smith (1998), Alcatel SEL TLH is clearly part of a global corporate strategy to gain market access to Central and Eastern Europe. Local suppliers are non-existent, despite existing domestic telecommunications production and the R&D capacities of TESLA, suggesting that the regional economic impacts are limited, apart from the employment of a relatively small, elite group of well-paid workers and managers. As observed by the same author, this reality contradicts the impressions of some local managers who have called the region '*a Slovak Sillicon Valley'*, pointing to the clustering of electronics firms in the locality.

Figure 4.2 Slovak Automotive Cluster:
A Porterian Perspective



Nonetheless, this has partly started to change after Alcatel Slovakia's Software Centre was established in Liptovsky Hradok in 1999 currently employing more than 600 workers. More generally, foreign investment has not been catalyst to the development of local production linkages and remains isolated, surrounded by struggling companies who have been excluded from the most lucrative Slovak markets.

The case of Alcatel SEL TLH and the analysis of the Slovak electronics industry that follows illustrate that any policy attempt to replicate "Silicon Valley" models in Slovakia would require substantial industrial modernisation, effectively promoting both indigenous industry development as well as a stronger "local embeddedness" of incoming global players. The need to anchor the industry into a regional economic structure is becoming all the more important, given the unprecedented growth of Slovak electronics manufacturing in the 1990s. The foreign-owned sector alone currently employs some 25,000 people in the following product sectors: automotive cable harness assembly, semiconductor/diode manufacturing, electronic connector/component manufacturing, electric motor manufacturing and other electronic assembly operations. Table 4.1 lists some of the key players surveyed, which established their operations between 1991 and 2002.

Table 4.1 **Foreign multinationals in the Slovak electronics industry**

Field of Operations	Company NAME	REGION ("kraj")	Employment	Established	Parent HQ
Automotive cable harness assembly	VW Elektrosystemy	Nitra	4 000	1996	GER
	Siemens Automotive	Kosice	2 500 (plus 2000 sub-contractors)	1993	GER
	Yazaki	Nitra	3 134	1994	JPN
	Leoni	Trencin	2 600	1993	GER
	Kromberg&Schubert	Nitra	1 600	1996	GER
	Punch	Zilina, Trnava	1 500	1998	B
	Sews (Sumitomo)	Nitra	1 000	1997	JPN
	Delphi Automotive Systems	Trnava	450 (will grow quickly to 1300)	2001	USA
	Todenco	Trencin	150	2001	JPN
Electronic components/ Connectors & circuit boards (incl. semicond's/ diodes)	Sony	Trnava	1 117	1996	JPN
	Matsushita	Zilina	1 060	1997	JPN
	ON Semiconductors	Trnava	300	1998	USA
	Molex	Kosice	480 (will grow quickly to 900)	1997	USA
	Semikron	Trnava	150	2000	UK
	ElectronikaSlovensko	Trnava	320	1992	GER
	Samsung Electronics	Trnava	na	2002	Korea
Electric motors	Emerson Electric	Trencin	1 765	1993	USA
	BSH Drives and Pumps	Kosice	980	1993	GER

Source: SARIO (2002)

The box below identifies key strengths and weaknesses of the Slovak electronics industry cluster.

Strengths and weaknesses of the Slovak electronics cluster

Strengths

- World-class companies operating substantial facilities in the country – e.g. Sony, Siemens, Matsushita, Alcatel, Molex, IBM, Emerson Electric, Bosch and Yazaki.
- Quality managers (both Slovak and international) operating these facilities. An extremely cost-effective and highly educated workforce can be found at all levels - from Plant Operators to Engineers and Managers.
- A central location at the heart of Europe's highway network to support customers in Central, Eastern and Western Europe.
- An excellent support environment, including telecommunications infrastructure throughout the country, excellent quality of life, a supportive education system, particularly at third level.
- A good regional spread of electronics facilities, with companies located in 22 towns/cities outside Bratislava.

Weaknesses

- Almost 75% of the 25,000 people employed in the electronics industry are in the automotive cable harness assembly at the lower end of the electronics manufacturing value chain.
- The sector is highly cost sensitive and susceptible to design changes that could significantly reduce labour inputs in the future.

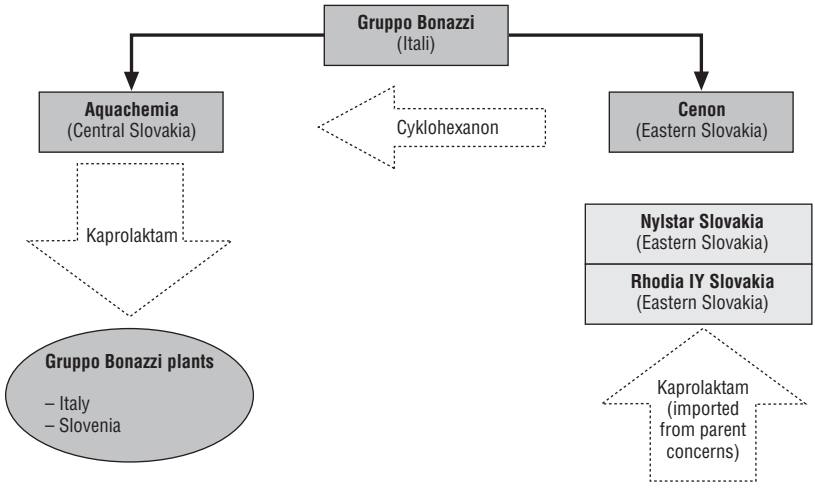
The electronics industry in Slovakia is under threat from more cost-effective sister sites, new greenfield sites in other more cost-competitive countries and outsourcing decisions made by parent companies.

While employment in the sector will grow significantly in the short term, it is unlikely that the sector will survive beyond 10 years unless radical policy action is taken with regard to encouraging the existing base of companies to gradually move into new higher value added products (most of the present base of companies can move in this direction and are already manufacturing higher value added products elsewhere in Europe) and encouraging new sectors of the industry to locate in Slovakia.

Chemicals

Several foreign as well as domestic investors operate in this sector, using the production sites of the former socialist chemical combinats. Figure 4.3 shows the linkages between key actors in the cluster, taking the example of the network around the Italian chemical concern Gruppo Bonazzi. This foreign investor processes cyclohexanone produced in the Eastern Slovakia in its subsidiary Aquachemia (located in Žilina, Central Slovakia). Aquachemia produces kaprolaktam is the basic material input for industrial yarns used in Gruppo Bonazzi plants overseas. Manufacturers of synthetic fibres located in the Eastern Slovak region of Humenne, Nylstar Slovakia and Rhodia Industrial Yarns Slovakia, would be capable of processing the whole production. The plants in Humenne in fact import the caprolactam, and thus represent a competition on the market.

Figure 4.3 Global chemical production networking in Slovakia



Source: TREND Analyses (2003)

Another example is an investment by the Czech agrochemical group Agrofert in the Istrochem company located in Bratislava. Benzene produced in Deza, Valasske Mezirici (Moravia, Czech Republic) and processed in the Ostrava (Moravia) plant of the Hungarian firm Borsodchem will be supplied to the Bratislava factory as a raw material input for rubber chemicals. With this co-operation, the Slovak company will be able to better utilise its production capacities (currently used only at 57%) also for the production of pesticides and industrial explosives.

However, the development of synergies through globally interconnected production networks is often complicated and sometimes prevented by persisting structural and operational problems characteristic to Slovak companies.

Clothing

Since the late 1980s, the East European clothing sector has witnessed a dramatic transformation. Driven by increasing costs in Western Europe, major western clothing retailers and buyers have increasingly expanded production into lower cost regions of post-communist Eastern Europe. Much of this growth has been governed by the EU's outward-processing trade (OPT) arrangements with Central and Eastern European countries, which have produced specific forms of pan-European interaction. One consequence is a burgeoning of clothing producers in East European regions, locked into supply relations with western buyers.

Smith (1998) considers the regional development implications of these emergent pan-European production relations and regional clusters in the clothing sector by drawing upon recent research on the Slovak clothing industry. In particular, his paper examines the emergence of asymmetrical power relations that knit together the pan-European linkages and regional clusters of clothing firms. Smith observes that many Slovak 'core' firms outsource primarily low-value tasks to a large number of small sub-contracting firms and micro-enterprise workshops, most of which are located in small villages surrounding the town of Presov. Two dynamics are at work in the local subcontracting of production to form clusters of interrelated firms in Presov. The first has involved the fragmentation of the former state-owned enterprise sector through two different processes: (a) the creation of a number of independent and privatised production units out of larger, former state enterprises, and (b) the establishment of new private firms by former managers in previous state enterprises. The second has involved the use of a dense network of smaller private firms and workshops by core Slovak contracting and producing firms with direct access to EU buyers and branded manufacturers. Smith suggests that many of the production activities are characterised by dense networks of relations among East European firms in regional clusters. However, such regional clusters are not characterised by high levels of technological innovation, but are the result of organisational innovation that involves complex and uneven sets of power relations.

Cluster policy

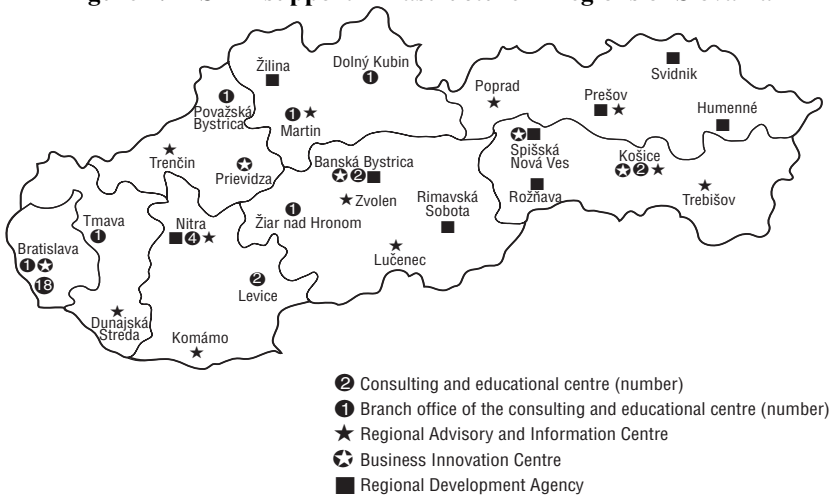
As a result of state socialist industrialisation, Slovak enterprises developed like 'cathedrals in the desert' located in previously

unindustrialised regions with few local linkages and without an adequate institutional backing typical of advanced market economies. Many supporting institutions were established in the 1990s, most of them being managed by national government administrations and modelled on similar organisations in the EU. The EU PHARE programme, in particular, has been highly influential by setting policy agendas and by providing much needed financial assistance and policy advisors. These policies have supported both SME development and the attraction of foreign investment in Slovakian clusters. In addition, a number of regional development programmes are operated. In general, these programmes do not specifically target clusters but nevertheless support their development.

SME support

In 1993, the former Ministry for Economic Strategy Planning pioneered the establishment of *Regional Advisory and Information Centres (RPIC)* in all 38 districts of Slovakia. Many of these centres were subsequently transformed into private businesses or incorporated into the RPIC Network coordinated by the National Agency for Small and Medium-Sized Enterprises (NADSME). At present, there are twelve RPICs (with five more branch offices) and five *Business and Innovation Centres* (BICs) operating in Slovakia. Figure 4.4 shows the geographical distribution of the SME support infrastructure in 2001. Since the current institutional support from the NADSME network (BICs and RPICs) is not comprehensive in terms of geographical coverage, another supplementary network of *First Contact Centres (FCC)* is now being created to act as a basic source of business information in the most economically depressed regions of Eastern Slovakia.

Figure 4.4 SME support infrastructure in regions of Slovakia



Source: Reproduced from Rehak (2001).

Table 4.2 Major Development Services provided to SMEs in Slovakia

Initiative	Description	Delivery	Funding
Access to finance for start-ups, expanding and hi-tech firms			
Loan and mutual guarantee schemes	Easier access to investment and operating capital for SMEs	NADSME, selected commercial banks, Slovak Guarantee and Development Bank (SZRB)	max. EUR 125,000
Micro loans	Loans to enterprises up to 10 employees	NADSME, Economy, BIC, RPIC	Up to EUR 11,300
JBIC-Japan Bank for International Cooperation	Loans to SMEs and their joint-ventures	JBIC and National Bank of Slovakia	EUR 226 million fund
Seed Capital Fund	Equity financing and loans to SMEs	NADSME through Seed Capital Company	max. EUR 113,600
Slovak Post Privatization Fund (EC, EBRD, Slovak Govt)	Venture capital for medium-sized enterprises	Professional fund manager	EUR 43 million for 10-year fund operation
Slovak-American Business Fund	Equity financing/ debt participation and loans to SMEs	Directly from the Fund (not via the banks)	Capital: EUR 54,350 to 2.71 million. Loans: EUR 45,450 to 340,900
"PODPORA"	Loans to SMEs	SZRB	Up to EUR 175,000 for up to 7 years
"ROZVOJ"	Loans to SMEs	SZRB	Up to EUR 1.450 million for up to10 years
Access to research, technological development and innovation			
Technology Transfer	Technology transfer project financing for SMEs	NADSME, Ministry of Economy, Centre for Advancement, Science and Technology (SARC), BIC, RPIC	Grants up to EUR 22,000
Office of Industrial Property	Promotion of the use and protection of R&D results (incl. patents)	-	-
Agency for Support of Science and Technology	Financing for science and technology related projects	Ministry of Education	-
Education and training			
"KVALITA"	Implementation of quality management systems in SMEs	NADSME	Technical training and documenta-tion: up to EUR 2,500. Certification: up to EUR 3,000
CEPAC Slovakia (Centre for Patronage and Long-tem Care for Starting Businesses)	Training and counselling to potential entrepreneurs amongst unemployed	National Labour Office, NADSME and CEPAC Soissons (France)	-
BATA Junior Achievement Slovakia	Student stock company	Volunteer business consultants	-

Internationalisation			
EURO Info Centres	Information on business contacts and co-operation opportunities in the EU	-	-
Internet Information Workplace	Internet training, web-based presence, e-commerce	NADSME, Foreign Trade Promotion Fund	-
Slovak Sub-contracting Stock Exchange	Information on business contacts and co-operation opportunities	UNIDO, NADSME	-

Source: Authors, based on information from www.nadsme.sk; Note: EUR = 40 SKK

Table 4.2 summarises the major policy initiatives to support SMEs in Slovakia. These are not specifically focused on clusters, but are available to all SMEs.

FDI promotion

Large multinational corporations play an important role in cluster building in Central and Eastern Europe. However, Slovak policy makers (especially during the Meciar governments in 1992-1998) have shown either too little political interest or a lack of priority in seizing this important national and regional development opportunity. In fact, the first proactive FDI policy was not introduced before March 1999, when the first Dzurinda government launched its *Plans for Addressing the Macroeconomic Imbalances and Competitiveness Issues in the Slovak Economy* popularly dubbed the 'economic package'. The key idea was to stabilise Slovakia's legal system and make it consistent with that of the European Union. Tax incentives have since been offered to incoming businesses incorporated in the form of joint-stock companies, in which at least 75% stake of authorised equity capital is held by a foreign person. An overview of the current incentive package offered since 1999 to incoming foreign investors by SARIO, Slovakia's one-stop shop investment promotion agency, is given in Table 4.3.

Regional development programmes

After the devolution of regional policy powers (from January 2001), the regions ("krajs") have played an increasingly central role in the practical implementation of regional development policy. Current regional development policy is programme-based, i.e. each region has compiled one or more programmes that translate a region's development strategy into specific measures. In particular, there are four "Regional Operational Programmes" (ROPs) elaborated for "Priority Regions" (East, North West, and South West) and Bratislava under the 2000-2006 National Plan for

Regional Development, designed to absorb EU PHARE Economic and Social Cohesion funding (Ministry of Construction and Regional Development of the Slovak Republic, 2001). The programmes of the four target regions have been examined through an exercise based on the Porter model and our firm survey. Attention was also paid to initiatives to develop regional business activity, in other words, whether the aim was to influence the birth of new firms and entrepreneurship, regional targeting of Slovak investments, or to draw foreign investments into the region, in such a way as to strengthen clusters.

Table 4.3 Slovakia's Incentive Package for FDI offered since 1999

Corporate tax rate	25%
Tax credits	Tax free up to 50% of qualifying expenditure outside Bratislava; in Bratislava up to 20%
Credit period	Up to 10 years
Investment for tax credit	Regions with under 10% unemployment: EUR 9.5 million; other regions: EUR 4.7 million
Fixed assets grants	None
Employment grants	*Labour Office:* up to 50% of the wage for 1 year, OR *2001 Incentive Act:* up to EUR 4,000 depending on region
Training grants	*Labour Office:* up to 50% of the training costs OR *2001 Incentive Act:* subject to a limit of EUR 240 EUR per employee
Research and development grants	None
Property-based incentives	A few developed industrial sites with less than 1,000 ha

Source: www.sario.sk

Generally, ROPs are characterised by broadness, poor targeting, and also a certain lack of courage. This is partly due to time constraints in compiling the programmes and partly to the inherent need to leave all options open. There is also the need for scrupulous adherence to the principles of the EU's Structural Funds (SF). Thus the regional programmes directed to EU funding may seemingly differ from each other, but their contents are quite similar. The measures under the SF-type regional programmes may be summarised under three headings: strengthening entrepreneurship, increasing the level of know-how, and the environment.

The evaluated programmes concentrate on developing the birth of new firms and entrepreneurship, and on improving the kraj's own existing firms (i.e. enhancing firm structure and rivalry). This choice of policy is consistent with the EU's regional policy that is based on the idea of growth 'from below' and relies heavily on the potential of SMEs. However, it may be difficult to induce growth and an endogenous, self-sustaining economic development process in regions that lack entrepreneurial tradition. This type of regional development policy does not lead to fast results, and even the

benefits as a whole may be minor in many regions. However, it works best in regions that already have the prerequisites to make use of new possibilities, whereas in regions that need most help the prospects for success are poorest.

The desire for FDI is not manifested in the programmes, although this desire may be seen in the background of the programmes. Neither do the programmes 'fish' for FDI, with the exception of Bratislava's programme. Although FDI has been scarce outside the capital city region, this path for growth should not be excluded from the activities under RDP in other parts of Slovakia. Different regions should actively seek to attract inward investors that would not be hampered by the peripheral location, or that might even benefit from it.

The ROP of *Bratislava* is a relatively consistent whole with international character. Bratislava's programme does not put as much emphasis on the birth of new firms or entrepreneurship as the programmes of the other regions/krajs. However, the region's status as the capital region places it on a different level as a target area for mobile investment and innovation projects to other Slovak krajs.

*North West'*s ROP emphasises entrepreneurship and the development of existing firms located in the region. The programme is characterised by independent initiative. The emphasis in the development of industries is laid on forest and wood-processing and related industries (paper, furniture) and electronics. Much attention is paid also to the development of know-how, innovations, and infrastructure. The cluster mapping exercise supports these areas of policy attention.

In the light of our analysis of the competitive advantages of the target regions, *South West'*s programmes should emphasise business and labour factors in order to strengthen its clusters. The development of labour factors is indeed firmly targeted. Business factors, on the other hand, get too little attention. In this kraj the regional programme meets the demand for the locational attributes required by strong industries. In addition to labour factors, the infrastructure and R&D environment are clearly supported in the programmes, so results may be expected from the implemented policy in terms of strengthening indigenous industry and inward investment.

In the *East* krajs the need for development is evenly distributed between all location factors. In this region, however, special attention should be paid to the development of labour and business factors. This is reflected in the programme.

For all of the Slovak "priority regions", which are to be covered by Objective 2 status with Slovakia's EU membership, ROPs are relatively

firm-centred, and thus may have great importance for the location decisions of firms. Some of the specific measures are directed to young firms and the activation of start-ups, and some to the development of favourable conditions for the growth of already established firms. The various firm subsidy actions are emphasised most. More emphasis could have been put on the improvement of R&D environment and infrastructure and the development of the operating environments of firms in general, because the locational significance of these factors is increasing.

International links

International links exist for firms in Slovak clusters via FDI and the activities of domestic SMEs.

Various players in the *electronics* cluster have established their Central and Eastern European head offices in Vienna (including Siemens, IBM, Hewlett Packard) and it appears that Vienna is becoming a bridging platform for this sector to the CEE region. Both in the areas of software development and digital technologies, there is an unsatisfied demand for highly-qualified workers, produced by the CEE education systems. Networking and "co-operation initiation" as well as creation of transnational regional infrastructures (e.g. the so-called BioTech- or NanoTechValleys) is currently a primary component of European innovation policies. Cross- and transnational co-operation is relevant also to the *automotive* cluster. The transnational links of the successful automotive cluster in Lower Austria with Central Europe has become an important regional location factor across the western borders of Slovakia. The growth of these two global high-tech industries (electronics and automotive) has stimulated a strong industrial interest in establishing EUROVALLEY, a state-of-the-art technology park, in the border region of Malacky, about 30 km from Bratislava City.

Last but not least, the production of high-quality food is an important industry in the region around Vienna. Especially the so-called Marchfeld, a rural region in the east/north-east of Vienna and to the south-west of Slovakia, which is an important vegetable growing area. Marcheld has an international reputation as a brand name for vegetables, with company Iglo selling the brand name for its deep-frozen vegetable food. It is believed there is a potential to develop a Central European centre for vegetable growing, which would make this region popular beyond the boundaries of the two neighbouring countries. Marcheld products would then be more competitive on the EU markets vis-à-vis large vegetable producer regions in France and Spain.

Having a gateway location, it is of strategic importance for Bratislava region to develop cross-border links with the neighbouring areas. Much has

already been said and published about the vision of an integrated functional urban region Vienna-Bratislava. However, it is only quite recently that a genuine planning of specific actions has started, mainly with financing from the Austrian government and a contribution from the EU's Interreg and Phare initiatives. Table 4.4 sets out a 'reality check' to examine Bratislava's potential of becoming an international high-tech centre, complementary to the Vienna region.

Table 4.4 Bratislava: An Innovative Region?

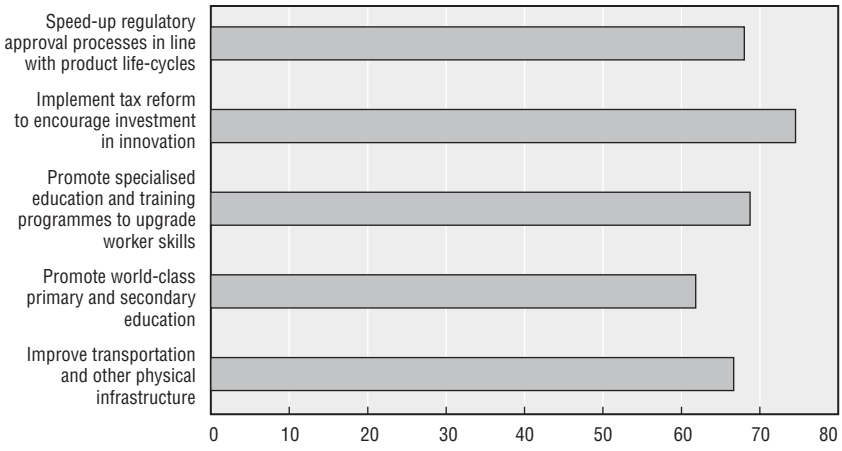
Requirement	Reality
Networks between R&D-intensive entreprises	Not developed
S&T, research, industrial and regional policy coordination for high tech	Absent
R&D infrastructure	Available, check market relevance
Central and local/regional government subsidies	Available
Skilled labour pools	Available, study on skills mix needed
Access to product markets	Yes
Venture capital	Finance for risky undertakings not easily available
Availibility of large entreprises	Yes, but R&D needs unknown
Entrepreneurial spirit	No track record in high-tech fields, but emerging

Source: own elaboration based on Nintied (1997).

Clusters and innovation

The company questionnaire provided additional information on a key area of policy interest, the promotion of innovation within existing/potential clusters. Firms in the identified clusters were asked to assess actions that governments at various levels can take that will help increase innovation in their host region. Figure 4.5 reports the findings and suggests priorities for policy action over the next five years. Overall, firms' preferences were distributed in favour of the measures which improve the general business environment.

Figure 4.5 Firms Top 5 Priorities for Improving Regional Innovation Systems



Note: % of total sample of 177 firms surveyed.

Clusters and social capital

Our company questionnaire also provides evidence about certain social capital aspects of Slovakian clusters, asking about the attitudes towards co-operation and trust among firms sharing the same regional location. Table 4.5 gives an idea of the average level of agreement/disagreement with a given statement among 177 firms surveyed. Possible answers were scaled from 1 ("disagree completely") to 7 ("agree completely"), with 4 representing a neutral view ("neither agree nor disagree").

As can be seen, the average answer was biased towards a "neutral view". A possible interpretation is that the atmosphere of trust and co-operation as perceived by the respondents is highly context-specific information, which makes sense only if analysed in a particular regional economic situation. Given our moderate research design we were unable to provide any detailed story of an existing or potential local cluster which would effectively capture the social capital aspects of geographical clustering.

Table 4.5 Attitudes and beliefs concerning co-operation and trust

Intense local competition between companies tends to contribute positively to standards of living for the average citizen	5.1
Companies that compete against each other in the region should establish closer ties and cooperative agreements than they have now	4.5
Entry of new competitors in the region harms the business environment and existing firms	3.4
Companies in close geographic proximity often end up sharing information that they do not share with distant firms	4.2
Presence of intense local competition between companies tends to foster innovation	5.4
Where possible, companies should seek to train workers through co-operative training programmes, rather than in-house training	4.4
For most firms, the benefits of having local competitors outweigh the costs	4.2
Projects that require cooperation and collaboration between firms in my region tend to cost more than they return	4.1
It is possible for companies to collaborate and compete at the same time	5.0
Cooperation between local firms has contributed directly to the prosperity of the region as a whole	5.4
Companies are worse off when they have to compete with other local companies to attract and retain skilled workers	4.4
Intense local competition between companies tends to help them increase productivity	5.3

Areas for improvement

Our research has combined location quotient data analysis with questionnaires and interviews to produce a first general picture of clustering behaviour in Slovakia. However, the limited availability of industrial and foreign trade data has not allowed us to carry out any detailed analysis of input-output linkages, innovation patterns or the social capital dimension of the 46 "spatial concentrations" which have been identified. The lack of official statistical capacity (e.g. input-output tables have not as yet been compiled and published in Slovakia) can to a certain extent be overcome by field research methods, but their application is very resource-intensive. Based on our research experience, we insist that a more systematic and comprehensive "cluster policy analysis" is needed to generate solid policy guidance. Such a proposition will have to be backed by a strong policy interest of the government and the relevant business community.

We further conclude that despite the theoretical underpinnings and recommendations of international agencies, including UNIDO, OECD and the European Commission, *no explicit signs of a cluster policy approach can be reported* in Slovakia either at the policy analysis or the policy development level. Although the priority to support SME development has clearly been established at all levels of governance since early 1990s, for the time being only two visible examples containing certain elements of the cluster approach can be found: first, in the context of the development of the Slovak automotive industry which has received priority attention since the

beginning of the 1990s, and, second, in the recent industrial park policy. The government efforts to build a strong domestic auto supplier base is much more a function of global production networking and internationalisation strategies dictated by multinationals rather than a function of any domestic "cluster-informed" government policy. Also, the recent boom of industrial parks in Slovakia is powered mainly by employment policy considerations of local authorities (addressing extremely high regional unemploment), rather than internationalisation or innovation policy priorities.

If there is any room for government intervention in clustering processes, we believe that the fundamental policy choice to be made in Slovakia is whether to promote *national or local competitive advantage.* Based on our incomplete analysis and understanding it appears that in terms of geographical level of governance, the Slovak "automotive cluster" is best targeted at the national level, while the low-tech, mostly labour-intensive, traditional Slovak industries like textiles, clothing, shoe-making and wood-processing make them more appropriate for policies based on strengthening the competitive advantage of host regions.

Entrepreneurship and inward investment form the basis for regional development. There are three levels on which they can be influenced through national regional policy: the targeting of foreign investment, the regional targeting of national investment, and the promotion of local entrepreneurship. The examination of existing regional programmes showed that especially entrepreneurship and independent initiative, found mainly in SMEs, are now emphasised in the programmes. These are clearly seen as the keys to regional development in both the national and EU's regional policy. The objective – in policy statements at least - is to initiate an endogenous development process by the regional policy subsidies. However, it seems that less policy attention has been paid on how to improve the target local areas in order to make them more attractive options for mobile investments both in high- and low-tech fields.

Poor targeting is a typical feature not only of the older generation of programming documents designed for pre-accession funding, but can also be seen in the recent draft documents for the much anticipated structural funding from 2004. This indicates that the Slovak government and the eight autonomous regions are somewhat at a loss as to how to initiate the desired endogenous growth process. It has been thought, rather, that by getting involved in as many activities as possible, the chances for getting rewards are greater. This has partly arisen from the planning practices of territorial policy makers of the 1990s and before. The aim of all encompassing and loosely formulated programme documents has – quite understandably - been to enable the financing of all possible development projects during the programming period.

Nevertheless, the progress from wish lists should have led more strongly to plan-of-action style programme documents with explicit statements on how the development aims are to be promoted by combining available resources. This would have made it possible to allocate the resources that are critical to development and identify the central shortages of resources. And here we believe is where the cluster perspective can be very instrumental to public policy-makers. It is worth citing Porter (2000:28) here, that "clusters provide a way of organizing thinking about many policy areas that goes beyond the common needs of the entire economy. Cluster-based thinking can help focus priorities and guide policies in science and technology, education and training, export and foreign investment promotion, and a wide variety of other areas … A cluster orientation highlights the fact that more parts of government have an influence on competitiveness than normally recognized, especially within government itself. Cluster theory makes the impacts of policies on competitive position much clearer and more operational. Effective solutions often require different parts of government to collaborate."

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ENDNOTES

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Chapter 5

Poland

by Elżbieta Wojnicka, Tomasz Brodzicki and Stanisław Szultka

This chapter presents evidence from four regional cluster studies and an overall cluster mapping project covering ten out of sixteen Polish administrative regions. The cluster mapping and regional cluster evidence show that there is potential for the development of competitive cluster structures fostering innovation in Polish industry. A brief overview of policy and institutions which support small and medium-sized enterprises in Poland are testimony to a quite well-developed support infrastructure, so far however without specific measures targeting clusters.[6]

Local cluster mapping methodology

The evidence in this chapter is drawn from two main types of research: surveys of firms and institutions in selected clusters and a cluster mapping exercise. This section provides a brief account of our working definition of clusters, the methodology for the cluster surveys and the methodology for the cluster mapping exercise.

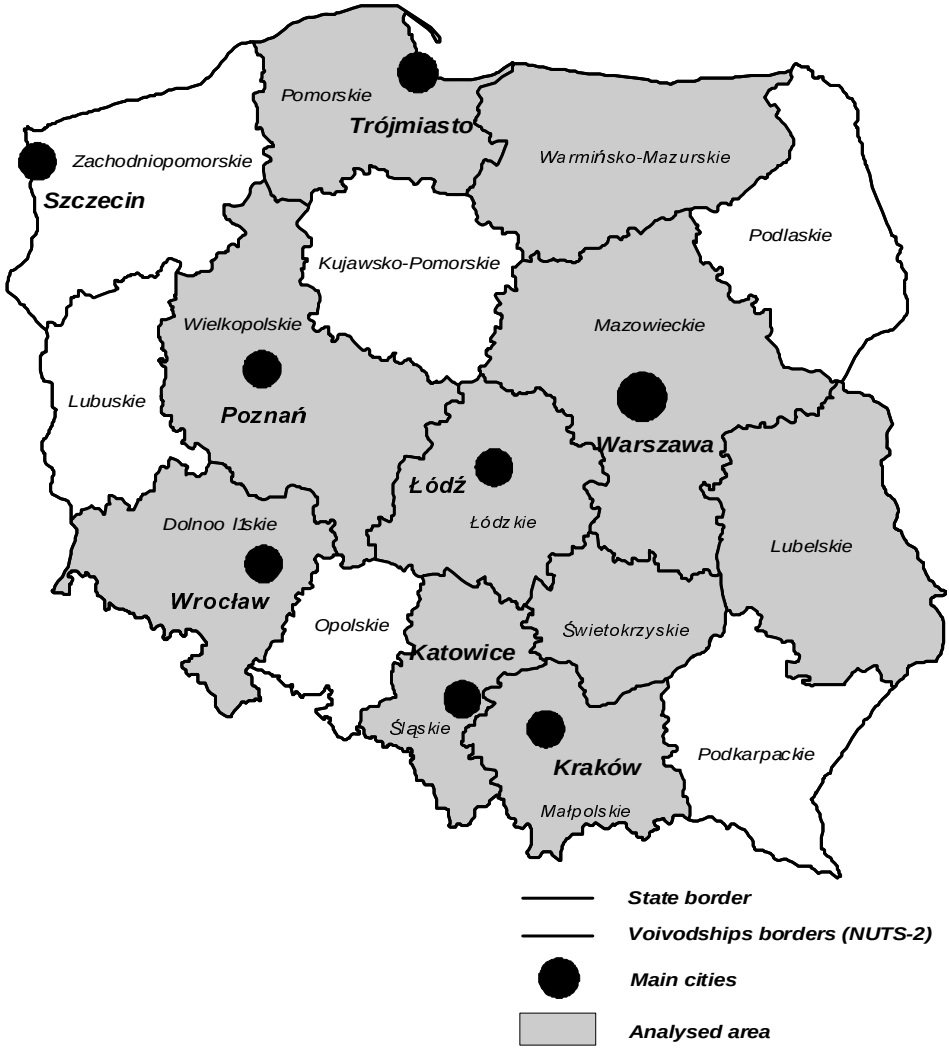
Working definition

The working cluster definition underlying both the empirical cluster studies and the cluster mapping exercise is compatible with the OECD core cluster definition of this publication. Thus in this chapter clusters are taken to be forms of interactive business activity based on embedding local firms in their regions and sectors. Cluster firms compete and co-operate with one another and show a stronger tendency to export than other firms. In our analysis of empirical studies and cluster mapping results, we focus on four cluster characteristics: localisation, co-operation, competitiveness and internationalisation. In reviewing the cluster mapping results, we created a specific characteristic: Localisation and internationalisation were summarised under the term "glocalisation" denoting a cluster's propensity to export while being embedded in a regional and local economic context.

Methodology for the cluster surveys

Empirical cluster surveys were undertaken by four independent research institutes. Figure 5.1 shows the regions covered by the surveys.

Figure 5.1 Polish regions covered by cluster surveys



Source: The Gdańsk Institute for Market Economics

In the first case study researching high-technology embryonic clusters in the Pomorskie region in the north of Poland, the Gdańsk Institute for Market Economics surveyed high technology firms in the biotechnology, computer, electronics and telecommunication, and engineering industries (Brodzicki et al., 2002). The survey was based on face-to-face and telephone interviews with 48 firms divided among the four sectors, covering about 30% of all

firms in these sectors in the region. Interviews in supporting R&D institutions were also carried out.

In the case of the second study portraying the emerging building and construction cluster in the Świętokrzyski region in south-east Poland, analysis was undertaken by the Świętokrzyski University based on face-to-face interviews (100) and questionnaires (290) targeting firms and institutions (business supporting firms, banks, local governments) connected with the industry.

The third case study undertaken by the European Institute for Regional and Local Development to analyse the printing cluster in and around the capital Warsaw (Mazowieckie region, central Poland) used a survey methodology with 55 enterprises in publishing and printing, as well as interviews with key individuals in institutions connected to the industry (Dziemianowicz and Olejniczak, 2002).

The fourth study on rural clusters in the Lubelskie Voivodeship in Poland's eastern border region was based on evaluating associations of rural producers and agrotourism.

Methodology for the cluster mapping project

Poland's first cluster mapping exercise was undertaken by the Gdansk Institute for Market Economics. The methodology of the cluster mapping project is based on statistical and empirical analysis. In a first step, significant concentrations in employment and number of firms (25% higher than the national average) were identified via the calculation of location quotients of all NACE branches in Polish districts (local administrative districts). Maps of significant concentrations of several core and related branches were created. For the qualitative survey, firms were selected in locations with the highest probability of a cluster's existence, i.e., locations with high industry concentrations in core branches and branches related to those core activities. Questionnaires were sent to 283 firms in 18 localities (273 firms being small and medium-sized with less than 250 employees). Firms reviewed represent nine core industry branches with two of them classified as high-technology.

Apart from a description of clusters, analysis of questionnaires by calculating correlation coefficients provided some important insights regarding the interactive, co-operative behaviour of firms in relation to other variables. Same-sector industry concentrations were compared assessing efficiency and innovativeness; regional transactions and internationalisation; co-operation among enterprises and with R&D institutions; institutionalisation of co-operation, co-operation with knowledge-intensive business services, participation in entrepreneurial organisations and relations

with local authorities; and lastly, mobility of staff In high-tech industries relatively large correlation coefficients were of the range 0.2 – 0.3 and in traditional industries 0.1 – 0.2. However, the majority of relations analysed had coefficients lower than 0.1 and were thus excluded.

The clusters

In this section, evidence of potential clusters both in high-tech industries and traditional sectors will be presented, covering ten out of sixteen Polish regions. The first subsection features cluster evidence from four empirical studies. The second subsection introduces results from Poland's first cluster mapping exercise undertaken by the Gdańsk Institute for Market Economics.

Existing empirical studies

In 2002, four regional studies on clusters came out (Brodzicki et. al., 2002; Dziemianowicz and Olejniczak, 2002; Olesiński and Predygier, 2002; Szymoniuk 2002; Tamowicz et al., 2003) analysing high-technology branches in the Gdańsk region, printing in Warsaw (central Poland), building and the mineral industry in the Świetokrzyski region (central Poland), as well as an analysis of cluster-like behaviour in agriculture of the Lubelskie voivodeship (south-eastern Poland). The key findings are presented in the boxes below.

High-technology embryonic clusters in the Gdańsk region

The emerging control engineering cluster in the Gdansk Region comprises about 60 firms situated in the city of Gdansk and neighbouring towns. Almost half of them deal with the manufacturing of control equipment while 35% operate services, 10% have a manufacturing-service profile and 15% are purely trading firms. Total employment in this sector throughout the area studied is about 2,200 people. A survey was undertaken of these firms. All but one of the firms interviewed had less than 50 employees, the single large firm employing about 500 people.

The surveyed firms were mostly suppliers to various traditional industries like shipbuilding, power utilities, air conditioning and automotive production. The study confirmed the knowledge intensive character of this cluster – on average, 60-70% of the employees hold university degrees. Although the firms operate mainly on the domestic market, the products they offer comply with the highest international standards. Major features of the emerging control engineering cluster are a common knowledge base (some firms are typical spin-offs; most of the firms' founders come from the local university of technology, in particular the electrical and control engineering faculty); strong links to R&D institutions on the regional level; informal co-operation among the cluster's firms; co-operative form of economic activity (almost all firms have partners and although the majority of them come from outside the region, 63% of the firms have partners at the regional level as well); relatively high intensity of trade fairs connected with the sector in the region; as well as quite strong vertical links

between the firms and the regional traditional industries they serve (e.g. the shipbuilding industry).

However, many shortcomings and barriers to cluster development were reported. Firstly, the existing regional business associations and chambers of commerce do not provide an effective dialogue or co-operation platform since membership in these bodies is not as developed as it needs to be. Most frequently, companies are members of national organisations, situated outside the region. This may be one of the reasons for a lack of formal co-operation between firms in the emerging cluster. Secondly, tacit knowledge transfer among firms - in the form of thematic seminars and conferences - is predominantly found at the national level. Although they constitute important business partners for some of the cluster enterprises in terms of subcontracting, the two larger enterprises cannot be classified as potential cluster leaders able to stimulate the development of the cluster or even to initiate any form of partnership among local enterprises. Vertical relations with customers (mostly buyer – supplier relations) occur chiefly with agents from outside the region. Technology and other inputs are mainly imported, although firms develop foreign technology according to their specific needs. Thirdly, co-operation with local authorities is very sporadic.

As opposed to the control engineering sector, biotechnology firms can hardly be classified as clusters even in the embryonic stage. There are less than ten firms in the region dealing with various biotechnology tools. The reason they are so few is that domestic demand for their products is very low, while industrial demand in the region is almost non-existent. The computer industry may be described as having a mature cluster-like form currently in the phase of capital concentration. It shows some features of a new path of cluster development based on capital relationships. In the rest of the sectors analysed, especially in electronics and telecommunication, clustering is mostly related to linkages with scientific infrastructure. However, the co-operation among firms on the regional level, both vertical and horizontal, is predominantly weak. Only in control engineering do we see quite strong vertical linkages to other firms in the region. Co-operation with local authorities is almost non-existent in all of the sectors.

Emerging Building and Construction Cluster in the Świętokrzyski Region

The Świetokrzyski Region in central Poland is an important centre of building and mineral industry and its construction industry shows some features of a cluster (Olesiński and Predygier, 2002).

The base for regional cluster development is a supplier – customer chain, originating with firms producing building materials, such as cement, stones, gypsum, lime, ceramic fixtures, as well as wooden items for building. Another important impulse for clustering is the abundance of a mobile labour force. Before transition, the region had been home to industry linked to the military-industrial complex with design offices, research institutes and advisory firms present. After a difficult transformation, the development of the building cluster stimulated growth of new consulting, marketing and exhibition design firms, as well as business incubators. Moreover, it attracted the interest of state and local authorities, as well as of political parties, workers' unions and professional and local associations.

Structural characteristics of the building cluster include the agglomeration of firms and supporting institutions, as well as a growing regional network based on local partnerships. Some of the firms in the cluster build relations to achieve globalisation creating holdings with larger corporations. For other firms, regional vertical linkages in the production chain are most important. There is also informal co-operation due to the geographical proximity of some building firms.

Results of questionnaires and interviews with representatives of enterprises and other institutions such as banks, local authorities, and institutions supporting businesses showed that mainly top managers perceive the importance of external relationships. The business environment is the source of new clients, strategic partners and partners which may provide suitable information for future strategic activities. The strongest external linkages characterised firms and business support institutions, while in the case of local self-governments and banks they were much weaker. The organisations surveyed operate both at domestic and regional levels. However, banks and business support institutions operate mainly on the domestic level, while firms and local governments are mainly regional. In terms of reciprocal relations among these different groups of agents located in the region, interactions among firms and banks and among firms and business support institutions are strongest. The relations of firms, local authorities and banks can be characterised as weak. Linkages among local authorities and business support institutions are also weak, but are being intensified.

The Świetokrzyski region is home to a building cluster based on co-operative and competitive relations. The appearance of this regional network stimulates the development of the entire region.

The Printing Cluster in the Warsaw Agglomeration

The printing industry is the most concentrated and dynamic industry around Warsaw, the nation's capital, showing some features of an emerging cluster (Dziemianowicz and Olejniczak, 2002). Various firms in the industry, especially competitors, are situated in geographical proximity. Printing and publishing houses are strongly linked to the local market as the major source of qualified labour and capital. The customers are also mainly local. Co-operation with the R&D sphere exists among distributors of printing machines and materials, but tends to be weak overall, usually taking the form of expertise ordered from universities.

Intensive co-operation among firms mainly has a vertical nature. There are strong linkages among printing and publishing houses, as well as between them and marketing and leasing firms (leasing firms are industry's link to the distributors of machines). Moreover, printing houses specialising in inscriptions co-operate with the packaging industry. There are also some interesting, although sporadic, examples of co-operation among publishing houses and IT firms. Large publishing houses, however, tend to organise these activities in-house.

The shortcomings of the cluster are connected mainly to its overall weak co-operation with the R&D sphere. One of the reasons is that the industry relies mainly on imported machines and production inputs. The role of industry associations as a cluster support structure is very restricted. The existing chambers have a relatively small number of members and are not connected to small and medium-sized printing enterprises, thusaccounting for the weakness of horizontal linkages among printing firms. Moreover, public authorities are only customers, not partners of the industry.

Rural Cluster - Structures in the Lubelskie Voivodeship

The Lubelski region in south-eastern Poland bordering on Ukraine is dominated by rural areas – 54% of its inhabitants live in the countryside. The development of rural clusters as a way to increase agricultural productivity and improve the situation of farmers is of prime importance for the region. A study of rural clusters based on associations of rural producers has shown some clustering evidence in the sector (Szymoniuk, 2002). Presently, two types of cluster-like forms may be found in the region: groups of rural producers and agrotourism clusters.

There are about 110 groups of rural producers in the Lubelskie Voivodeship. These groups are legal entities (in the form of associations) and their main aim is marketing their members' products. The associations, as forms of a cluster-structure, often organise training courses for their members, and co-operate with universities and other associations. The associations also work on obtaining quality certificates for their products.

One type of agrotourism cluster is the local associations of agrotourism firms. There are eight such associations in the Lubelski Region, which together form the Lubelski Union of Agrotourism Associations. All of the local associations in Poland belong to the Polish Federation of Rural Tourism "Hospitality Farms". The local associations provide many joint activities for their members. These are activities including marketing, development of quality standards, lobbying and fundraising.

Table 5.1 presents a summary of the existing cluster studies reported above.

Table 5.1 Summary of existing cluster studies

Cluster base	Interactions on regional level		Internationalisation	Development barriers
	Strong	Weak		
High-technology firms (control engineering, biotechnology, computing, electronics and telecommunication)				
- Common knowledge base (one university or research institute) and/or business development path (foreign contacts or origin in one firm). - Geographical proximity in terms of Gdansk Agglomeration. - Well-developed R&D infrastructure for the sector.	- With R&D institutions. - Informal contacts among firms. - Some formal horizontal links among firms based on capital relations (computing).	- Vertical relations with customers and suppliers (domestic level dominates). - Formal horizontal linkages among firms. - Interactions based on participation in regional entrepreneurial organisations. - Co-operation with local authorities.	- Technology and production inputs mainly foreign. -Strong linkages to foreign scientific institutions (biotechnology). -Co-operation with foreign firms in some cases.	-Lack of financial support institutions. -Low demand. -Lack of trust among entrepreneurs.
Traditional: Printing cluster				
- Geographical proximity in the Warsaw Agglomeration. -Relying on local market: for customers, capital and employees.	- Vertical supplier - customer relations among firms. -Interactions with KIBS like marketing firms, sometimes IT firms.	- Linkages to R&D institutions (weak overall). - Interactions based on participation in entrepreneurial associations. - Co-operation with local authorities.	- Technology and production inputs mainly foreign.	- Lack of business information and information about potential partners. - Lack of internationalisation.
Traditional: Building cluster				
-Agglomeration of firms and supporting institutions, as well as a growing regional network based on local partnerships.	- Supplier-customer relations. - Linkages to supporting institutions (KIBS, banks, public support institutions). - Growing role of capital relations. - Informal co-operation among firms.	- Weak co-operation of firms and banks and local authorities.	- Co-operation with large foreign enterprises sometimes in the form of holdings to enter foreign markets.	- Limited to top managers' interest in external relationship building.

Rural clusters				
- Associations of firms with some joint activities in the common interest of members.	- Formal co-operation of the associations' members. - Informal co-operation with local external partners.	- Relations with customers. - Relations with universities and vocational schools (weak overall).	- Co-operation with foreign firms (customers). - Opportunity for Polish-Ukrainian formal co-operation.	- Lack of tradition and the will to co-operate among firms. - Low management skills of farmers. - Fiscal barriers (higher taxes for associations). - Lack of regional and local policy supporting clusters.

Source: The Gdańsk Institute for Market Economics

Cluster mapping project

The Gdansk Institute for Market Economics cluster mapping project found a number of significant industry concentrations, all but two situated in the more developed regions of Poland: in central Poland - Mazowieckie (capital Warsaw), Wielkopolskie (main city Poznan) and Łódzkie (main city Lodz); in southern Poland – Dolnośląskie (main city Wroclaw), Małopolskie (main city Crakow) and Śląskie (main city Katowice); and in northern Poland – Pomorskie (main city Trojmiasto, bordering on the Baltic Sea). Two concentrations are situated in a structurally weak region - Warmińsko-Mazurski in northeastern Poland at the Baltic Sea. Most of the significant industry concentrations are situated in Wielkopolskie and Mazowieckie, Poland's most developed regions. In terms of average income per capita at the district level, about half of the industry concentrations were above (mainly in urban districts), and half of them below national average.

With regard to firms in significant industry concentrations, co-operative behaviour and mobility of staff in terms of their participation in various conferences, courses and trade fairs turned out to be positively correlated with the wealth of a district and the number of people living and working there. A higher propensity to co-operate was also noticed among firms considered to be more innovative demonstrating the necessity of interaction in an efficient innovation process. The most innovative firms also had much higher labour productivity and were located in richer districts.

In terms of sectors, high technology firms were more likely to co-operate, had higher labour productivity and investment, as well as R&D expenditures per employee, but lower export activity. In high-technology sectors, a positive correlation was found between profitability growth, as well as technological advancement of a firm's product and the intensity of co-operation with R&D, foreign knowledge-intensive business services

(KIBS) and staff mobility. Moreover, the export level for a firm in this sector was positively correlated with the intensity of co-operation within the R&D sphere. High-tech sectors rely heavily on new knowledge often not yet codified. Hence, interaction with universities and tacit knowledge flows through mobility of staff have significant impacts on a firm's competitiveness.

In the traditional sectors, correlation coefficients between indicators of efficiency and interactive behaviour were lower than in the high-tech sectors. The most significant positive correlation was between intensity of co-operation with business services and growth of demand, market share and profitability, as well as intensity of co-operation with the R&D sphere and growth in market share. However, in the traditional sectors the correlation between exports and intensity of co-operation was usually slightly negative, except for the level of co-operation with foreign and domestic business services (located outside the region of location). Traditional products usually do not require intensive co-operation within the sphere of R&D as the technology is already well-known. However, co-operation with business services, especially foreign, may help to place products on foreign markets.

As previously demonstrated by many other studies such as the EU Innovation Survey, analysis showed that intensity of co-operation is positively correlated with the size of a firm – larger firms are usually more likely to co-operate and less afraid of it (European Commission Eurostat, 2000). To sum up, the analysis of relations in the cluster mapping project in Poland confirmed the benefits of interactive, cluster-like behaviour. In the next sections, industry concentrations, first in high technology sectors, then in traditional sectors are presented in more detail.

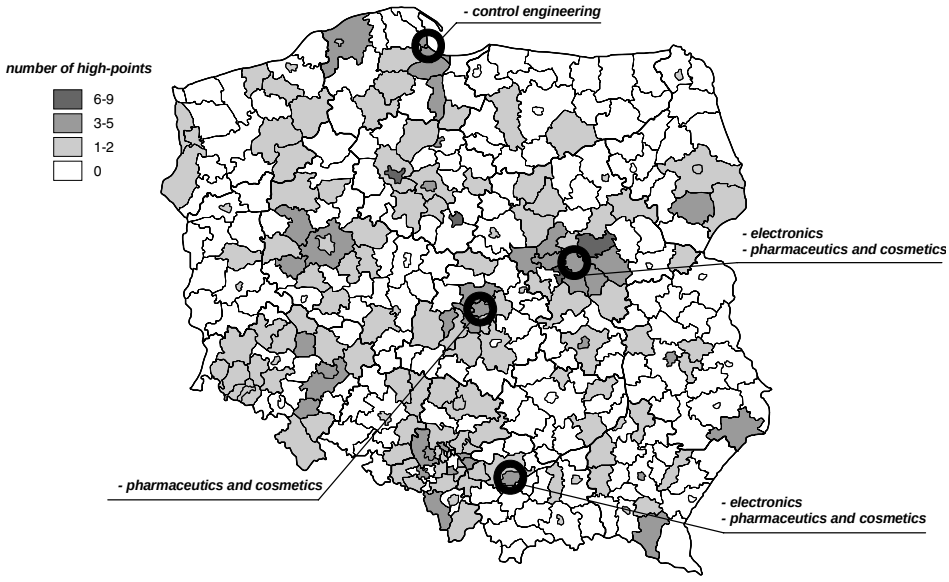
High technology sectors

High and medium-high technology industries, referred to together here as high technology, may provide a key stimulus for the development of networks and clusters since they are heavily dependent on formal and informal links with various R&D institutions. High-technology industries also supply traditional industries with modern equipment and production inputs, which are crucial to their competitiveness. Some reasons for the more 'co-operative culture' of this industry are as follows: 1) high-tech industries are usually more knowledge-intensive and need access to knowledge institutions, 2) the industry has a higher share of employees with tertiary-level education in total employment, so they are more likely to collaborate (especially in informal ways) with researchers at universities, 3) these industries are located in big cities where a variety of public R&D institutions as well as consulting firms and specialised services are present.

High-technology firms are present in all regions of Poland but are concentrated mainly near large agglomerations, which also are major university centres. The sector operates predominantly in the domestic market (the share of high-technology industrial branches in Polish exports in the years 1999-2001 was approximately 13.7%). One of the important characteristics of the Polish high-technology sector is strong linkages to R&D infrastructure. These linkages are much stronger than in the case of traditional firms. Almost 75% of high-technology firms declared some form of co-operation with universities, etc, compared with 10% for all small and medium-sized firms in Poland. The profitability of the high-technology sector is also higher than the domestic sector average (Umiński, 2001; Wojnicka and Wargacki, 2003; Rot and Brodzicki, 2000; Zielińska-Głębocka, 2000).

According to Neven's (1995) classification of industrial sectors, which is based on the intensity of production factor utilisation, the principal feature of high-technology industries is the high intensity of human-capital utilised in their activities. The following NACE groups have therefore been included in our analysis: 24 - manufacture of chemicals and chemical products, 30 - manufacture of office machinery and computers, 32 - manufacture of radio, television and communication equipment and apparatus as well as group 35.3 - manufacture of aircraft and spacecraft. When we apply Neven's classification, we obtain 60 regional high-technology concentrations and 279 potential high-technology concentrations spread around 165 out of a total 373 districts. Figure 5.2 shows these regional concentrations, with obvious features of clustering activity in high technology industries around the major metropolitan areas of Poland such as Warsaw (the capital city), Gdańsk, Poznań, Łódź, Wrocław, and Cracow as well as Katowice. This is in line with the notion of dependency of the high technology industries on a relative abundance of human capital resources as well as easy access to knowledge (in terms of R&D organisations, universities, etc.) However, in some cases the regional concentrations exist in districts situated outside major metropolitan areas (for example Mławski). In-depth analysis of high technology sectors was undertaken for Warsaw, Cracow, Łódź and Gdańsk, the capitals of Mazowieckie, Małopolskie, Łódzkie and Pomorskie voivodeships. The sectors analysed in the cluster mapping project were electronics and related activity in Warsaw and Cracow, and pharmaceuticals and cosmetics in Warsaw, Łódź and Cracow.

Figure 5.2 Clusters in high-technology sectors



Source: The Gdańsk Institute for Market Economics

Electronics

Electronic products account for 5% of Polish exports. In the cluster mapping project, two concentrations of electronics firms and related sectors were analysed. They are situated in two large urban agglomerations – Warsaw (Warszawa) in central Poland and Cracow (Kraków) in the south. Statistical analysis indicated that these are the places with the highest probability of existence of a cluster. These cities are also among the most important university and research centres in Poland. Table 5.2 compares each concentration with the other and with the national average for all firms surveyed in the cluster mapping project on key characteristics that can be argued to be important in cluster development. As the Table shows, the behaviour of firms in the two concentrations analysed reflects some cluster features in comparison to the national average. They reported a more interactive way of doing business, strong relations with the R&D sphere and high staff mobility. However, they tend not to institutionalise their co-operation and their co-operation with local authorities is weak. Cracow seems to have a more cluster-like culture than Warsaw, but firms in Warsaw are more effective and innovative. In Cracow quite intensive co-operation may be an asset for growth in the future. A higher than average importance

given to business founders' origin and historical factors such as location, especially in Cracow, may indicate a tradition of such activity in these areas. The Warsaw cluster is export-oriented and more internationalised in terms of mobility of staff, the latter is also important in Cracow. On the Polish landscape both of these groupings represent cluster-like structures.

Table 5.2 Comparison of concentrations in electronics

	Cracow		Warsaw	
In comparison with:	Warsaw	National Average*	Cracow	National Average*
Efficiency	-	-	+	+
Innovativeness	-	0	+	+
Regional transactions	+	+	-	0
Internationalisation	-	-	+	+
Cooperation with enterprises	+	+	-	+
Cooperation with R&D	+	+	-	+
Institutionalisation of co-operation	+	-	-	-
Co-operation with KIBS	+	-	-	-
Participation in entrepreneurial organisations	-	-	+	+
Relations with local authorities	-	-	+	-
Mobility of staff	0	+	0	+

Source: The Gdańsk Institute for Market Economics on the basis of a company survey, *National average for all the firms surveyed in the cluster mapping project

Competitiveness and glocalisation

The two electronics "clusters" in Cracow and Warsaw were mainly constituted of small firms with 5-49 employees (50% of firms in each cluster). However, the average size of a company, especially in Cracow, decreased over the period 1997-2001. In Cracow there was also a drastic fall in total employment within the grouping of firms, while in Warsaw the employment was stable. The Warsaw "cluster" performed better than Cracow's in terms of investment and exports. In general about 20% of sales by Warsaw firms were exported while this figure was only 3% in Cracow. Warsaw firms also spent on average twice as much on research and development as Cracow firms. During the last three years more Warsaw firms introduced a managerial innovation like a new market strategy or a new corporate structure. Warsaw firms were also more innovative in terms of new products. The increased efficiency of the Warsaw "cluster" may be a result of its higher innovation.

About half of sales in both "clusters" were made on the domestic market but outside the region. Cracow firms were slightly more embedded in the region in terms of vertical transactional relations. About 40% of their purchases of materials, equipment and new technology were made in the

region while for Warsaw this was about 30%. However, for Cracow firms the domestic level was the most important in terms of such transactions; while for Warsaw in terms of supply foreign markets were the most important. In terms of internationalisation as measured by foreign transactions as well as co-operation with foreign partners (KIBS) and mobility of staff abroad, Warsaw firms performed better than both Cracow and the Polish average. In sum, 35% of firms in Warsaw and 20% in Cracow participated in trade fairs taking place abroad and employees of about 20% of firms in Cracow and Warsaw took part in seminars and training courses abroad. Some firms in both cities used foreign IT firms and technology brokers and one firm in Warsaw used a foreign consulting firm.

Co-operation with other firms

Firms in Cracow were more prone to co-operation with both SME and large enterprises than firms in Warsaw Table 5.3. Strong co-operation in Cracow was taking place in supply and distribution. Firms in Warsaw co-operated more often than firms in Cracow in research and development. Institutionalisation of co-operation was relatively unpopular in both concentrations, however it was more popular among Cracow firms where it usually took the form of a loose association.

Table 5.3 Co-operation of the surveyed electronic firms with other enterprises, according to their size

All firms in a grouping	Cracow		Warsaw	
Cooperation with partners being:	SME	Large enterprises	SME	Large enterprises
Strong (60-100% of firms co-operating)	Supply Distribution	Supply Distribution		
Medium (25-60% of firms co-operating)	Marketing Services Training Trade Fairs	Trade Fairs Marketing Services Training Quality Credit guarantee	Services Distribution Trade Fairs Supply R&D Marketing	Trade Fairs Services Supply Distribution
Weak (less than 25% -30% of firms co-operating)	R&D Market ing Research Quality Credit guarantee	R&D Market research	Market research Training Quality Credit guarantee	R&D Market research Training Quality Credit Guarantee Marketing

Source: The Gdańsk Institute for Market Economics on the basis of firms' survey.

Co-operation with other firms was mainly viewed as a source of new business opportunities and better information about the market and

technology. A lack of trust among partners was the third most important barrier to co-operation for firms in Warsaw while in Cracow it was the most important. In Warsaw, the biggest obstacle was the threat that ideas would be stolen. Firms in both groupings stated that their relations with suppliers and customers had a positive impact on quality, timing and product improvement, however contacts with customers were valued somewhat more highly.

More firms from Warsaw than from Cracow belonged to various entrepreneurial organisations and these were usually national organisations. This is probably due to their location in Warsaw – the capital city where most of these national organisations are also located. The rate of participation by Warsaw electronic firms was higher than the national average. However, firms from Cracow tended to find such participation in general more valuable than firms in Warsaw and find it especially important for lobbying.

Co-operation with R&D institutions, business services and local authorities

Firms in both groupings co-operated with R&D institutions less intensively than with other enterprises. Their co-operation with R&D was stronger than in traditional sectors, but in Warsaw it was lower than the average for high-technology sectors: 75% of firms in Cracow and 62% in Warsaw have some form of co-operation with R&D. Co-operation was strongest with technical universities and research units in the form of joint meetings. The main benefit of such co-operation for Warsaw firms was access to the research infrastructure and machinery, while for firms in Cracow most highly valued was access to the knowledge required for innovation. From the perspective of Cracow firms, the main barrier to such co-operation was a lack of financing, while Warsaw firms reported that the needs of universities do not often coincide with those of business.

Firms in both clusters most often used regional knowledge intensive business services (KIBS) and sometimes national, however in general they relied quite weakly on external services. Firms in Cracow used KIBS a bit more often than in Warsaw. They especially used consulting and IT firms, as well as marketing firms. Firms in Warsaw quite often used regional business supporting institutions. Firms in both groupings relied mainly on regional banks, some of them use national and one firm in Cracow used a foreign bank. None of them used venture capital funds although these were present in their regions.

Electronic firms in both Cracow and Warsaw were characterised by higher mobility of staff than the national average. They did best in terms of

participation in training courses in the region and abroad in Cracow; and participation in national and foreign trade fairs and foreign conferences among Warsaw firms. The share of staff with tertiary-level education in the electronics clusters was one of the highest in Poland – over 40% in both groupings. It is proof of the knowledge-intensive character of the firms.

Firms from Warsaw co-operated more often with local authorities than firms in Cracow, however co-operation in both groupings was weaker than the Polish average. Firms in Cracow had only buyer-supplier relations with local authorities, while firms in Warsaw also exchanged information and had an ongoing dialogue with local authorities as well as co-operation with them for the development of the region.

Pharmaceuticals and cosmetics

Pharmaceuticals and cosmetics are highly concentrated in large agglomerations like Warsaw, Cracow, Poznan, Łódź and Gdańsk. Statistical analysis revealed that three industrial concentrations – Warsaw, Cracow and Łódź are the most likely to host clusters and they were chosen for further studies. In particular, the groupings in Warsaw and Łódź seem to form clusters. They demonstrate interactive business activity and very strong links to knowledge institutions. In Łódź even relations with local authorities are quite strong. All the groupings are also competitive. The importance of the founder's origin and historical factors such as location indicate tradition of similar activity there. Moreover, intensive co-operation with business services on a local level especially in Warsaw and Łódź suggests that a suitable business and institutional environment exists for this high-technology sector in these cities.

Table 5.4 Comparison of pharmaceutical and cosmetic concentrations

In comparison with national average*	Warsaw	Łódź	Cracow
Efficiency	0	0	0
Innovativeness	+	++	0
Regional transactions	0	-	-
Internationalisation	0	++	++
Cooperation with enterprises	++	+	+
Cooperation with R&D	++	++	-
Institutionalisation of co-operation	++	-	+
Co-operation with KIBS	++	++	-
Participation in entrepreneurial organisations	+	-	-
Relations with local authorities	-	+	--
Mobility of staff	+	+	+

Source: The Gdańsk Institute for Market Economics on the basis of a company survey, *National Average for all the firms surveyed in the cluster mapping project

Competitiveness and glocalisation

Two of the concentrations studied in pharmaceuticals and cosmetics – Warsaw and Łódź – were characterised by higher competitiveness compared to the average of all localities studied and compared to the Cracow area. This was visible with respect to company performance (in terms of increase in demand or their profitability) but the advantage was even stronger in terms of innovativeness (both product and process innovations) – more than 75% of all enterprises in these areas introduced product innovations during the last three years.

Linkages at the regional level was the most important for enterprises located in the Warsaw agglomeration, especially with regard to purchasing machinery, technology licences and staff mobility (professional training, participation in conferences and trade fairs). In Łódź, the regional level was also important in terms of staff mobility and participation in professional associations. This confirms the high potential of R&D institutes and the availability, especially in Warsaw, of KIBS providing specialised services for this industry. An exception is the Cracow concentration, with no significant connections at the local level.

The international market was an important source of machinery and technology licences (about 50% came from abroad), but foreign suppliers provided more than 25% of raw materials for this industry. The Warsaw area and to some extent Łódź also had good access to international networks of technology transfer (relatively high staff mobility and participation in international professional organisations). In general the foreign market was not very important as a source of demand since it accounted for only about 10-15% of sales revenue (mainly generated by firms with high export shares in their revenue), but there are many enterprises (in the Warsaw area 75% and in Cracow and Łódz more than 50%) that export up to 5% of their output. This may suggest that the latter are beginning to be competitive on international markets.

Co-operation

In terms of the number of firms that co-operate and the intensity of co-operation, the pharmaceuticals and cosmetics industries co-operated more than the other industries studied. Almost all of the firms co-operated with other enterprises and about 80% of them co-operated with R&D institutions. A relatively high propensity to co-operate is confirmed by higher participation in professional associations and other co-operative activities such as participation in professional training, conferences or trade fairs.

However, there were significant differences among the various locations within this industry. The Warsaw and Łódź concentrations were

characterised by a higher propensity to co-operate among all the enterprises surveyed and in all forms of such activity (co-operation with enterprises, R&D institutions, local authorities as well as use of consulting firms and participation in professional associations) than the Cracow concentration.

Companies from the Warsaw cluster are also more embedded in the local economy especially in terms of buying machinery and licences or participation of staff in professional training, conferences and trade fairs. This reflects the centrality of Warsaw in terms of both biological and chemical research institutes.

After reviewing cluster evidence from high-tech branches of electronics, pharmaceuticals and cosmetics, clustering in traditional branches, such as for example furniture making and shipbuilding.

Traditional sectors

The Polish economy is dominated by traditional industries and services. These industries represent around 80% of Polish exports according to Neven's definition of high technology (with export strengths particularly in shipbuilding, furniture and textile industry, vehicle production and the metal industry) and also dominate employment. The performance of these sectors is therefore crucial for the Polish economy. Clustering might enhance their competitiveness and innovativeness and sustain employment. In the cluster mapping project, concentrations of 8 sectors situated in 6 Polish regions were analysed (see Figure 5.3).

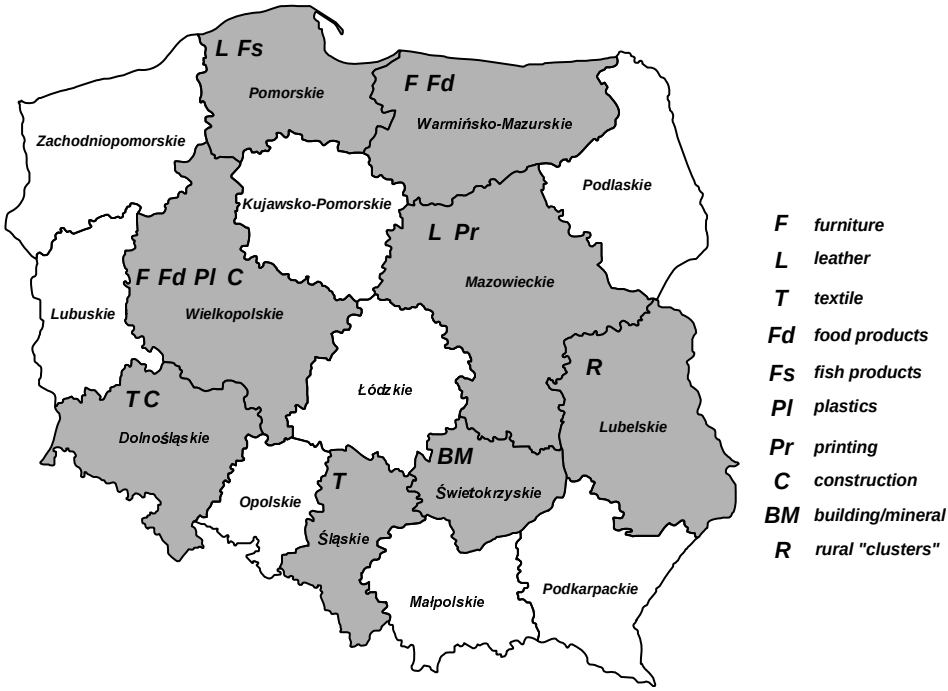
Furniture manufacturing

Furniture manufacturing is one of the principal sectors of the Polish industry, with a significant share in total employment, total sales and exports. The export-orientation of the industry is reflected both in a positive and steadily rising trade surplus as well as in various indicators of demonstrated comparative advantage with principal trading partners – member states of the European Union. From the Porterian perspective this could be indicative of the potential existence of functioning cluster systems.

The map of concentrations in the furniture manufacturing and related sectors (Figure 5.4) shows a distinctive pattern of sectoral localisation. The majority of enterprises are situated within an area of a concave belt stretching from southern parts of Wielkopolskie in central Poland through seven western and northern voivodeships of Poland to Warmińsko-Mazurskie. The second major concentration is situated in south-eastern Poland. Questionnaires were sent to randomly selected enterprises situated in the three most promising industrial concentrations in the vicinity of

Poznan (17 *powiat*s[7] – F1 further on), Oleśnica and Kępno (10 *powiat*s – F2) as well as Olsztyn (9 *powiat*s – F3).

Figure 5.3 Traditional branches studied and their location[8]



Source. The Gdańsk Institute for Market Economics

The strongest cluster features are seen in F2 – Kępno-Oleśnica and the concentration in Poznań. Both are efficient and internationalised and are prone to co-operation. In F2 particularly, co-operation among enterprises is strong, although not institutionalised. The Poznań concentration has strong links to knowledge services and institutions which indicates the existence of a suitable environment there. Both groupings also have quite intensive relationships with local authorities. In F1 there is a significant presence of foreign capital which has a dominant share in 17% of the enterprises under investigation. Table 5.5 compares cluster features in the three concentrations with the national average.

Table 5.5 Comparison of furniture concentrations

In comparison with national average*	F1 -Poznań	F2 – Oleśnica-Kępno	F3-Olsztyn
Efficiency	++	0	+
Innovativeness	+	++	0
Regional transactions	--	-	0
Internationalisation	++	++	0
Co-operation with enterprises	--	++	-
Co-operation with R&D	+	0	-
Institutionalisation of co-operation	++	-	+
Co-operation with KIBS	+	-	0
Participation in entrepreneurial organisations	-	-	-
Relations with local authorities	++	+	-
Mobility of staff	+	-	-

Source: The Gdańsk Institute for Market Economics on the basis of a company survey, *National Average for all the firms surveyed in the cluster mapping project

Competitiveness and glocalisation

In terms of employment dynamics in the period 1997-2001, two furniture manufacturing concentrations - F1 and F3 - can be classified as growing. In general all three concentrations increased investment expenditures in the period considered. Taking into account total sales figures and employment dynamics, the Poznan concentration is the most significant with F3 experiencing the most dynamic growth and quickly catching up the leader. In the F2 case, total sales declined slightly in the period examined.

Firms in all the furniture groupings represented the most efficient and internationalised concentrations found in the cluster mapping project. However, regional transactions were very weak. The most prominent location factors indicated by the enterprises included: the origins of firm-founders, well-developed infrastructure and significant communication accessibility, a cheap and qualified labour force.

Co-operation with enterprises

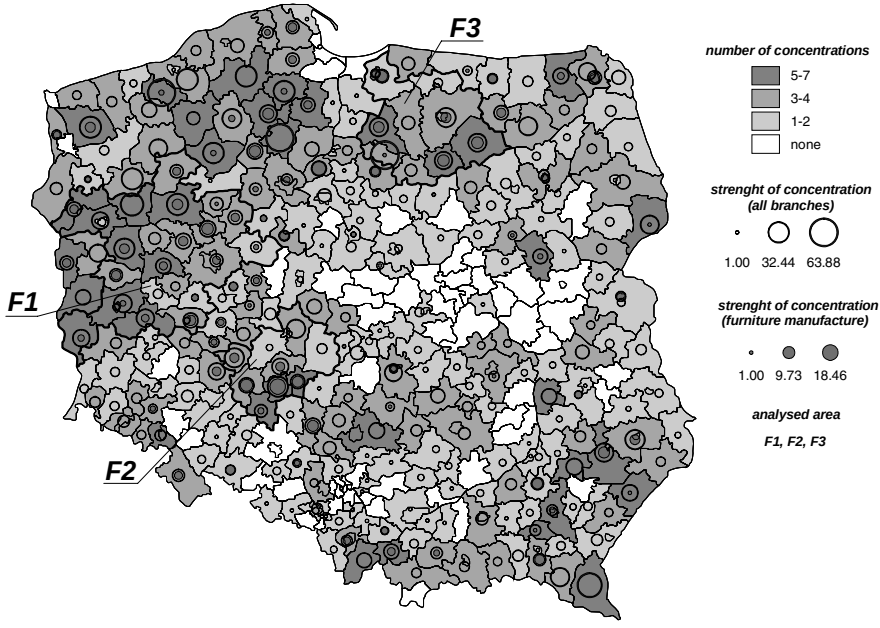
The majority of enterprises in these concentrations co-operated with other enterprises in the same sector, the only exception being the concentration in Poznan (F1) where 55% of firms did not report co-operative links to other companies. The existing co-operation schemes predominantly took the form of a loose association or were unorganised or occasional.

The major obstacles to co-operation identified included contradictory intentions or objectives, a lack of mutual trust, bad experiences from past

co-operation, and fears associated with illegal imitation. It is important to note here that the majority (66% in F1 and 50% in F3) or a significant part (33% in F2) of enterprises in these concentrations indicated that there was no need to co-operate with other enterprises within the sector. This attitude towards co-operation and networking must therefore be considered a principal obstacle to effective cluster formation and/or subsequent development.

The dominant areas of co-operation with other enterprises functioning in the sector were related to employee training schemes, provision of material and stock, product distribution, marketing and participation in trade fairs. They thus represented both forward and backward vertical linkages as well as horizontal linkages.

Figure 5.4 Furniture manufacture in Poland – regional concentrations



Source: The Gdańsk Institute for Market Economics

Co-operation with R&D institutions, business services and local authorities

In general, co-operation with R&D in furniture manufacturing was rather limited and sporadic. The most significant forms of co-operation included commissioning of studies as well as participation in conferences.

Firms co-operated mainly with technical universities and specialised R&D institutes. Enterprises in F1 and F2 showed the most interest in co-operation with the R&D sectors.

In the area of specialised services, co-operation with providers of financial services as well as software providers was dominant. Co-operative linkages with other specialised services varied between the concentrations: in F1 these included co-operation in the fields of consultancy and design; in F2 co-operation with technology brokers and technology consultants; and in F3 co-operation in the field of marketing and PR as well as SME support institutions. In the case of Poznan, co-operation with specialised services at the regional and national levels dominated. In the two remaining concentrations, co-operation at the regional level was the most significant (especially the case in F1 and F3). It is important to note that enterprises in each of the three furniture manufacturing concentrations had links with foreign providers of specialised services (this was especially the case in F1). Links to foreign service providers were related mainly to financial services, technological brokering and marketing/public relations.

Staff mobility (participation in specialised training schemes, sectoral seminars, conferences or fairs), was comparable to the national average and was limited mainly to the regional and national levels, however an international dimension in this field was also present (especially in the case of participation in foreign fairs). Staff mobility was highest in F1.

Co-operation with local and regional self-government institutions was significant in the industrial concentrations of Poznan and Oleśnica-Kępno. It mainly took the form of participation in public procurement and joint actions in the area of regional development.

Leather and Textile Industries

Clothing is an important Polish export product. The major concentration of the textile and clothing industry in Poland is Łódzkie voivodeship, however in the cluster mapping project two other significant concentrations of textile firms in Lower Silesia (Dolnośląskie in south-western Poland) and Bielsko-Biała (in Śląskie in southern Poland at the border with Czech Republic) were analysed. Similar to textiles, leather and leather products manufacturing is a very low-tech industry and two concentrations of such firms in Słupsk in Pomorskie in northern Poland and Radom in Mazowsze in central Poland were analysed. All consist mainly of small firms of 5 to 49 employees. All the groupings were strongly embedded in their regions in terms of tradition of such activity there. The leather groupings in particular seemed to form cluster structures, as the presence of other firms in this sector was a very important location factor for them. However, all of the

textile and leather firms had a low propensity to co-operate especially with the various knowledge intensive institutions, a characteristic of their traditional character. They also rarely had any relations with local authorities. The strongest, although also relatively weak, was co-operation with other enterprises. In particular, firms in Radom and Bielsko-Biala, if they co-operated, tended to institutionalise their co-operation. The most cluster features were shown by textile firms in Bielsko-Biala and leather firms in Radom. These clusters were also the most effective and innovative of the four analysed (see Table 5.6)

Table 5.6 Comparison of leather and textile concentrations

In comparison with national average*	Leather Słupsk	Leather Radom	Textile Lower Silesia	Textile Bielsko-Biała
Efficiency	0	0	-	++
Innovativeness	0	+	-	+
Regional transactions	--	-	0	--
Internationalisation	++	--	-	+
Cooperation with enterprises	--	0	-	-
Cooperation with R&D	-	--	---	0
Institutionalisation of co-operation	-	++	-	++
Co-operation with KIBS	0	-	-	--
Participation in entrepreneurial organisations	-	-	-	+
Relations with local authorities	-	--	0	--
Mobility of staff	-	--	--	-

Source: The Gdańsk Institute for Market Economics on the basis of a company survey, *National Average for all the firms surveyed in the cluster mapping project

Competitiveness and glocalisation

In terms of efficiency measured by variables such as employment growth, labour productivity, exports per employee, profitability, market share and demand, the best performing cluster turned out to be in Bielsko-Biała. On the contrary, the other textile concentration of Lower Silesia was the least efficient in the period 1997-2001 of all the groupings analysed and it was the only one where employment fell. The efficiency of the leather clusters reflected the domestic average. However, the leather clusters differ from one another especially in terms of export activity. The cluster in Radom had almost no exports while the cluster in Slupsk, like textile clusters, especially the one in Lower Silesia, exported much more than the average among all firms in Poland surveyed.

Textile firms in Bielsko-Biała and leather firms in Radom were the most innovative. Both concentrations were characterised by a higher than average number of patent applications over the preceding 3 years. Moreover, the textile grouping did well in terms of product innovations and introduced

some radical innovations – new for the branch in Poland. The leather grouping introduced less novel products, but succeeded in terms of organisational innovations. The innovative concentrations of these four were also more efficient. Nonetheless, R&D expenditures in all textile and leather clusters were very low, which is a characteristic of such low-technology branches.

Firms in these groupings bought and sold inputs and machines mainly on the domestic market outside their regions. The region was a quite important source of new machinery and appliances for firms from Radom and Lower Silesia and of new technology for Lower Silesia. The leather concentration in Slupsk and textiles in Bielsko-Biała were significantly internationalised both in terms of foreign transactions and co-operation with foreign partners. On the contrary, the Radom and Lower Silesia concentrations had almost no internationalisation at all. The internationalisation of firms in Bielsko – Biała may derive in part from their border location. Here 70% of firms exported and half of total sales in the grouping were made abroad (in case of the other textile grouping it is only 3%). Quite high export shares were also seen among the firms in the leather groupings, however in terms of supply abroad only the concentrations in Bielsko-Biała (textile) and Słupsk (leather) reflected significant foreign relations. The majority of licenses and half of the machines as well as one third of materials used by the firms in these concentrations were foreign. Moreover, 70% of firms from Słupsk and nearly 50% from Bielsko-Biała participated in trade fairs taking place abroad. Some firms from Slupsk used foreign technology brokers and one firm used foreign IT and marketing firms.

Co-operation with enterprises

The textile and leather firms analysed rarely co-operated with other enterprises, especially with large ones. Most prone to co-operation were leather firms in Radom and textile firms in Bielsko-Biała. If cooperation occured there, it mainly concerned supply and quality upgrading. Moreover, these firms tended to institutionalise their co-operation most often in the form of a loose association. Most firms of the leather and textile-Lower Silesia groupings did not belong to any organisation of enterprises. The rate of company participation was higher than the national average only in Bielsko-Biała and they belonged mainly to domestic organisations located outside the region, with some regional participation as well. The textile firms from Bielsko-Biała found their participation important mainly for lobbying and integration with the business environment. The main reason co-operation was restricted among these firms was the threat that ideas

would be stolen. Other key obstacles were lack of trust, bad experiences, contradiction of goals and lack of financial resources.

Co-operation with R&D institutions, business services and local authorities

Firms in all the groupings very rarely co-operated with the R&D sphere. As much as 62% of the textile and leather firms did not have any form of co-operation and this number is even lower than the average for traditional firms from the cluster mapping survey. Only firms from Bielsko-Biała quite often commissioned studies from R&D institutions and co-operated with scientists from universities. Firms in Bielsko-Biała and Słupsk sometimes co-operated with centres for technology and innovation transfer.

In comparison with the national average, textile and leather firms very rarely used business services, although quite often they used regional support institutions like regional development agencies, counselling centres etc. Firms from leather groupings also quite often used Polish marketing firms. Some firms in Slupsk and in Lower Silesia used venture capital funds and in Slupsk firms quite often used foreign technology brokers and design firms.

Employees of the textile and leather firms rarely participated in conferences and training courses. However, they quite often took part in trade fairs. The traditional character of the sector may be a reason for this. Mobility of staff and transfer of tacit knowledge in this way was positively correlated with education of employees. In the textile and leather firms, the percentage of employees with university education was very low.

Firms from all the groupings except for textiles in Lower Silesia relatively rarely had any relations with local authorities. If co-operation occured, it mainly took the form of a dialogue and exchange of information. For about 20% of firms, local authorities were their customers.

Agro-food and fish processing

Statistical analysis showed a correlation between agriculture (NACE 01) and the food processing industry (NACE 15). The agro-food industry is not characterised by very strong concentration in particular areas. There is however a significant concentration in the western and northern regions of Poland. Two geographical areas were chosen for the survey – one situated in the Warmińsko-Mazurskie voivodeship in the north of Poland (next to Olsztyn) and the second comprising some LADs in Wielkopolskie voivodeship with the central role played by Poznań.

Fishery and fish processing were excluded from the agro-food industry for separate analysis. This industry is highly concentrated in some local districts (Gdańsk, Gdynia, Słupsk, Lębork and Puck) in Pomorskie voivodeship in the north of Poland. All concentrations had an interactive style of business activity in terms of a relatively high propensity to co-operate with different entities: companies, R&D organisations as well as other institutions. An exception was cooperation with business service providers, which is relatively strong only in the area of Olsztyn. Moreover, they were quite competitive. They were found to have many features of clusters (see Table 5.7).

Table 5.7 Comparison of fish and food processing concentrations

In comparison with national average*	Food - Wielkopolskie	Food - Olsztyn	Fish - Pomorskie
Efficiency	0	0	0
Innovativeness	-	0	++
Regional transactions	+	+	-
Internationalisation	-	0	++
Cooperation with enterprises	+	++	-
Cooperation with R&D	+	-	+
Institutionalisation of co-operation	+	+	+
Co-operation with KIBS	-	-	-
Participation in entrepreneurial organisations	+	++	+
Relations with local authorities	+	+	+
Mobility of staff	+	+	+

Source: The Gdańsk Institute for Market Economics on the basis of a company survey, *National Average for all the firms surveyed in the cluster mapping project

Competitiveness and glocalisation

In terms of efficiency measured by variables such as market share, profitability and increasing demand, all of the agro-food and fish processing clusters were similar. However, fish processing and to a lesser extent the agro-food industry in Olsztyn area had an advantage over the Wielkopolskie concentration when product and managerial innovations and technological advancement of products were considered. Analysis of the agro-food and fish processing industries showed that the better-performing companies were those with stronger co-operative links.

The local level was very important for both of the agro-food concentrations. Most of the firms were supplied with raw materials mainly from within the region (on average about half of their purchases were made in the region). A similar situation was observed in terms of sales of their output. Proximity to the agglomerations like Poznań and Olsztyn is the

reason that on average these firms sold about 40-60% of their output on the local market. The local level was also important for enterprises located in the Wielkopolskie region for machinery purchases and technological licences, and to a lesser extent employee participation in professional training and conferences. It is important to note that companies in both these areas were very heterogeneous in terms of importance of the local business environment – some companies were very strongly embedded in their regions and others had relatively weak links to local business actors. From the perspective of the fishery and fish processing industry only two factors – access to raw materials and membership in professional association – were highly important in the regional dimension.

Companies in the agro-food industry had relatively weak links to international markets. They exported only about 10% of their output. Foreign markets had a slightly higher share in terms of supplying machinery and licences. International staff mobility and participation in foreign professional associations (professional staff training, participation in seminars, conferences and trade fairs) was a little more intensive in agro-food groupings than the Polish average. In the fish processing industry, the situation was completely different. About 30% of output was sold abroad and these firms were importing a significant share of their machinery as well as 100% of their technology licences.

Co-operation

Both agro-food concentrations were characterised by a higher propensity to co-operate than the average for all enterprises in the cluster mapping project. Less formal forms of cooperation with R&D institutions like commissioning of studies or informal cooperation with researchers dominated in both cases. However, the enterprises located next to Olsztyn were more co-operative in terms of the number of co-operative linkages or co-operation density (but not in terms of co-operation intensity). The agro-food concentration in Poznan was characterised by relatively stronger, in comparison to all analysed areas, and more advanced forms of co-operation such as participation in R&D projects.

In the fishery and fish processing industry, more than 70% of enterprises co-operated with R&D institutions and the intensity of this co-operation was higher than the Polish average. Moreover, it included not only informal co-operation but also more formalised co-operation such as joint research projects. A similar situation was found in terms of co-operation with other enterprises and business services, but in this case the intensity of co-operation was weaker. A relatively strong 'co-operative culture' may derive from the size of the firms surveyed – in this industry large firms are over-represented and such firms are more prone to co-operate with external

partners. It is important to note that companies with relatively stronger co-operative links also more evaluate more highly the benefits of such co-operation.

Plastics and Construction

The plastic concentration analysed in the cluster mapping project and characterised further on was competitive, however it did not show many features of a cluster, especially in the field of co-operation among enterprises (Table 5.8). Concentrations of construction firms are examples of service clusters. They were more embedded in the regional economy than an average industrial grouping. In comparison with other groupings, they were less competitive. Their propensity to co-operate with external partners reflected the national average. They had more features of a cluster than the plastic concentration, however they did not actually form mature clusters.

Table 5.8 Comparison of plastic and construction concentrations

In comparison with national average*	Plastics	C1-Poznań	C2-Dolnośląskie
Efficiency	+	--	-
Innovativeness	0	0	-
Regional transactions	-	+	++
Internationalisation	++	-	-
Cooperation with enterprises	--	0	0
Cooperation with R&D	+	0	+
Institutionalisation of co-operation	--	+	-
Co-operation with KIBS	--	+	+
Participation in entrepreneurial organisations	-	--	++
Relations with local authorities	+	+	++
Mobility of staff	-	+	+

Source: The Gdańsk Institute for Market Economics on the basis of a company survey, *National Average for all the firms surveyed in the cluster mapping project.

Plastics

Plastic and chemical products constitute a significant share of Polish exports (together about 7%). In the cluster mapping project, a strong correlation between the location of plastics (NACE 25.2) with rubber and rubber products (NACE 25.1) and manufacture of basic chemicals (NACE 24.1) was identified. From the initial map of concentrations, ultimately only one concentration of the broadly-defined plastic industry was chosen for an in-depth analysis. The concentration consists of three bordering *powiats* (local districts) situated in the heart of the Wielkopolskie voivodeship: Poznań, Poznański and Śremski (P1) in central Poland. There is a significant presence of foreign capital in the concentration as a result of FDI inflow in

the past. In the majority of cases, the FDI inflow into the concentration took the form of a greenfield investment around the mid-1990s which could be indicative of strong cluster-related features attractive to foreign investors.

In terms of employment dynamics in the period 1997-2001, this concentration can be described as steadily growing. In the same period, the concentration experienced a significant rise in total sales and exports, as well as total investment. Despite an increase in the ratio of exports to total sales, the majority of enterprises sold products on the national and regional market. The grouping was however comparatively internationalised as it both exports and has foreign partners. The international linkages of a concentration's enterprises are predominantly related to acquisition of resources as well as production equipment and in terms of sales through significant export-orientation. Provision of specialized services by foreign providers is limited.

Co-operation

The majority of enterprises in this concentration co-operated with other enterprises in the same and related sectors, however these predominantly were of an occasional or unorganised nature. The major barriers to co-operation included a lack of interest in co-operation itself and lack of mutual trust. As is frequently noted in the literature on the subject, trust is one of the key factors determining the creation and subsequent development of industrial clusters. The most prominent forms of co-operation were related to provision of materials and stocks, distribution of products, certification procedures and R&D activities. The enterprises were slightly more prone to co-operate with larger and established companies than with small and medium-sized enterprises. As much as 60% did not belong to any entrepreneurial associations.

Co-operation with research and development institutions by the plastics concentration in Poznan was generally limited (the majority of firms had no interactions at all). In the area of specialised services, firms in Poznan had strong links both in terms of density and significance to financial services, software providers and design companies and these were mainly at the regional level.

Construction

Construction is an important sector of an economy, as it creates multiplier effects. Following the general methodology employed in the cluster mapping project, several regional concentrations of broadly-defined construction firms were identified, in particular NACE 45 – building, and some of NACE 26 – mineral industry. The two most promising

concentrations were selected for empirical analysis: one consisting of two local districts – Poznań and Poznański in Wielkopolskie voivodeship (C1) and the second consisting of two local districts – Świdnicki and Dzierżoniowski in Dolnośląskie (C2).

In terms of employment dynamics, the two construction concentrations could be classified as stable (C1) and declining (C2). The Poznan concentration experienced stable growth in the period 1997-2001 in terms of both total sales and total investment while the Dolnoslaskie concentration suffered a pronounced decline in these categories. The construction firms operated mainly on the regional market, which is characteristic of their service nature. They were very weakly internationalised both in terms of transactions and in co-operation with foreign partners.

Co-operation

In the two construction concentrations under analysis, approximately one third of the enterprises indicated a lack of co-operation with other enterprises in the sector. Approximately 20% of the firms reported that co-operation was unorganised or occasional. Only the entrepreneurs in the Poznan concentration identified benefits in terms of lowered credit costs and accelerated company development. There the co-operation seemed to be more beneficial. The major obstacles to co-operation within the branch were very similar in both cases including: contradictory objectives, lack of mutual trust and lack of funds for co-operation. The dominant areas of co-operation were related to training schemes, services, supply of materials and stock, R&D, distribution and in several cases marketing. Co-operation among SMEs rather than with large companies dominated.

The majority of enterprises in the C1 concentration did not belong to any sectoral or general entrepreneurial associations. From this point of view, C2 showed more cluster-related features as 80% of enterprises belonged to entrepreneurial associations mainly at the national and regional level. The companies in both construction concentrations indicated high costs and lack of financing as major obstacles to their co-operation with the R&D sector. However, lack of interest in such co-operation schemes as well as lack of adequate partners in the R&D sector were also indicated.

In the area of specialised services, enterprises in the construction industry had strong links, both in terms of their density and significance, to financial services, software providers and design companies. At the same time co-operation schemes with specialised services had the highest density and significance at the regional level with the national level playing a secondary role. It is important to note that companies from the Dolnośląskie

concentration (C2) had not established links to/with foreign providers of specialised services.

The majority of enterprises in both concentrations sent their employees to participate in specialised training courses, sectoral conferences and seminars as well as sectoral fairs on a permanent or occasional basis mainly at the regional level with the national and especially foreign level having a significantly lower significance.

Another important dimension of links within a functioning cluster are links to local or regional administration or self-governmental bodies. A minority of enterprises in both construction concentrations had no links with these institutions. The existing co-operation was generally limited to participation in public procurement projects and general dialogue and exchange of information. However, some companies, especially in C2, also indicated participation in common projects on regional development.

Synthesis of findings and comparison of clusters

With regard to co-operative behaviour, the most cluster features were apparent in the high-tech (pharmaceuticals and cosmetics and electronics) concentrations, as well as in the agro-food and fish industries and construction in Dolnośląskie. A quite interactive climate is characteristic of the textile grouping in Bielsko-Biała. Apart from electronics in Cracow, intensive co-operation is reflected by high competitiveness. Furniture concentrations are less prone to co-operate but they are the most competitive, except for the grouping in Olsztyn. The most embedded in the region are services – the construction concentrations and fish industry concentration.

Major barriers to co-operation among enterprises for all firms surveyed are contradicting goals and lack of trust – about 30% of firms pointed out these obstacles. Other important barriers are the threat of having ideas stolen, lack of financing and lack of any perceived need to co-operate. However, in general the benefits of co-operation received a higher evaluation from those interviewed: over 60% state that co-operation brings new business contacts and over 45% that it provides better access to information about markets and technology.

About one third of firms find co-operation beneficial because it increases trust, accelerates a firm's development and lowers operational costs. Firms value both contacts with suppliers and customers, but relations with customers are slightly more highly valued as having an impact on timing, quality and innovation activity at the firm. Firms more often co-operate with other enterprises than with R&D institutions and this mainly

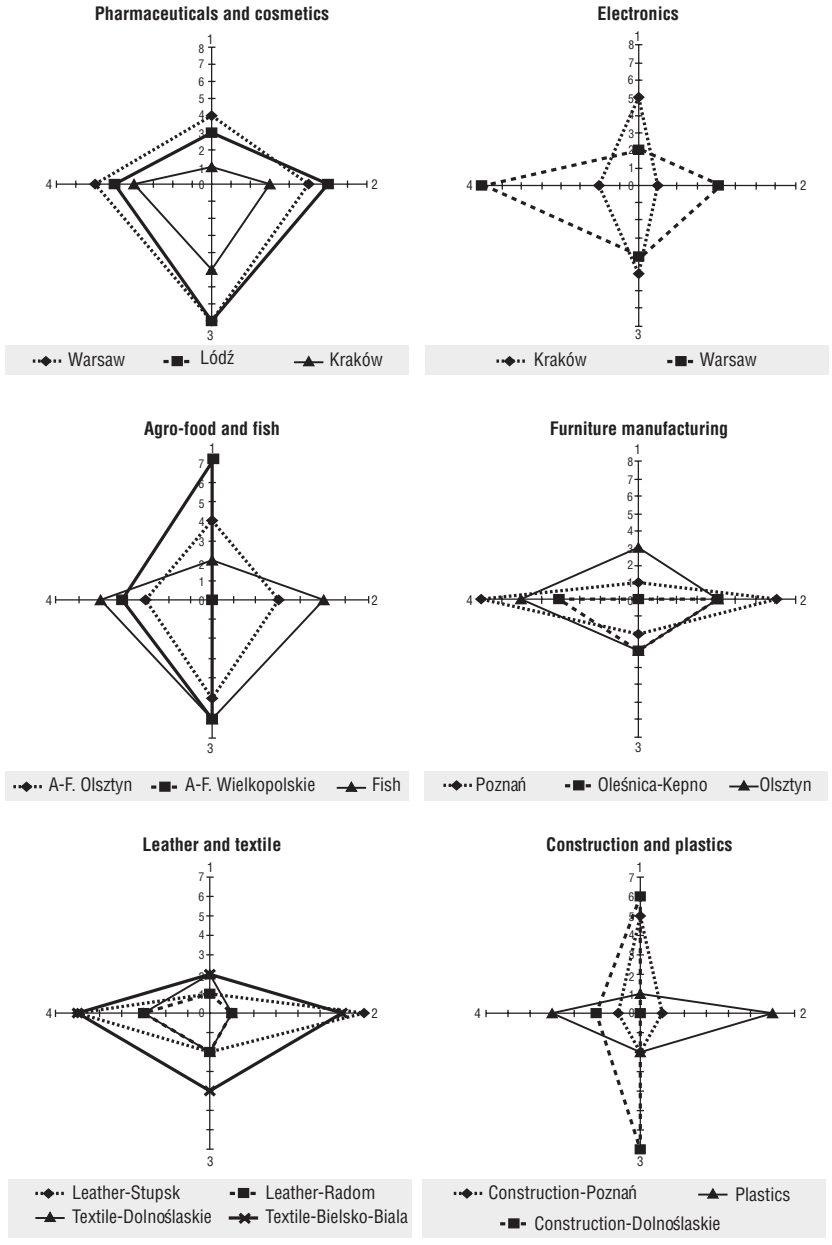
concerns supply and distribution – vertical relations – as well as employee training, marketing and participation in trade fairs.

A lack of any form of co-operation with R&D institutions was reported by about 75% of firms while about 23% reported no cooperation with any other enterprise. Of firms co-operating with other firms, over 80% institutionalise co-operation; usually in the form of a loose association. In general, the firms would like to co-operate with universities, however a significant obstacle here is the high cost of such co-operation and a lack of funding for it among firms. About 30% of firms also state that R&D institutions do not meet their needs. Relatively often firms outsource IT and design services, however co-operation with other facets of the business environment is sporadic, especially with business support institutions. On average 70% of companies have some relations with local authorities but the majority of these are of a buyer-supplier nature. About 30% of firms exchange information and have a dialogue with local authorities, and about 20% participate in the process of regional development initiated by the authorities. Therefore some signs of networks based on local partnership can be reported.

Although vertical relations in co-operation among firms dominate, there are also some examples of horizontal co-operation. Links to the business environment differ between particular concentrations, but in high-tech they are strong in terms of co-operation with the R&D sphere. The attitude of firms surveyed in the cluster mapping project shows potential for cluster development in the analysed areas. The general impression from analysis of their behaviour is cause for more optimism regarding the possibility of cluster culture developing in Poland than was found in the conclusions of previous regional studies, especially those carried out in the industrial branches.

Figure 5.5 assesses and compares the industry concentrations identified in the cluster mapping exercise according to the cluster characteristics of localisation, globalisation, co-operation and competition. All of the concentrations were characterised by stable overall employment in the period from 1997 to 2001. This is a demonstration of their relative competitiveness as employment throughout the economy fell in this period.

Figure 5.5 Comparison of concentrations analysed in the cluster mapping project



Note: 1 - Localisation 2 - Internationalisation 3 – Co-operation 4 – Competitiveness

Source: The Gdańsk Institute for Market Economics

International links

Trade

Concentrations of firms analysed in this cluster mapping project have the Porterian characteristic of clusters as they are relatively likely to export. The average export percentage of sales for the firms surveyed was 20% while this figure for all SMEs in Poland surveyed by GIME in 2001 was 4% (Umiński, 2001). The most internationalised in these terms were traditional concentrations, particularly furniture, textiles, and fish products as well as one leather grouping. These groupings usually also have foreign partners and buy materials and investment goods abroad. However, in terms of supply chains some high-technology concentrations are internationalised, in particular pharmaceuticals and cosmetics, and electronics in Warsaw.

Foreign direct investment

Since the 1980s, Polish firms have opened themselves up to foreign investment. On the basis of a 1976 regulation, the SME sector comprised among others so-called Polonia firms owned by non-residents. There were 46 of them in 1980 and 727 in 1989. In April 1986, the New Law on Foreign Direct Investment was introduced. Between July 1986, when the first joint venture company was registered and 1988, permission was given for 52 joint-ventures, mostly to SMEs. In 1989, the level of employment in all joint-venture companies was about 30,000. The Polish government continues to actively attract foreign investment. For this, fourteen special economic zones (SEZ) are in existence. These SEZs are industrial areas with specific privileges, such as tax exemptions, which were created to accelerate the development of the country through the growth of employment and by attracting foreign capital and investors, mainly in regions lagging in development. As agglomerations of firms such zones might become clusters.

An amendment of the law on SEZ implemented in 2002 adjusted the law to European requirements (Ambroziak, 2003). Some of the firms surveyed in the cluster mapping project may be located in SEZs. In the case of six out of 18 groupings analysed, special economic zones of profiles similar to those of the concentrations are located in the same districts. This is true: a) in northern Poland for the fish industry in Pomorski region and leather industry in Slupsk and the Pomeranian and Slupsk SEZ, b) in north-eastern Poland for the furniture and food industry in Olsztyn and Warmińsko-Mazurska SEZ, c) in central Poland for the pharmaceuticals and cosmetic concentration in Łódz and Łódź SEZ d) in southern Poland for the electronic concentration in Cracow and the Special Economic Zone Kraków Technology Park (PAIZ, 2002).

Foreign capital plays a crucial role in the privatisation and restructuring of the Polish economy. By investing in Poland, foreign private owners have helped to build an ownership structure based on private capital. When they set up their own companies or form joint ventures with Polish capital, they speed up rank-and-file privatisation. Simultaneously, foreign capital participates in the privatisation of state enterprises, the transfer of state enterprises to the private sector using legal, statutory procedures. Foreign direct investment, the transfer of capital to gain revenue from economic activity, is the form of foreign capital inflow that gives the best restructuring effects. FDI helps to change the ownership structure to reflect those in mature market economies. The share of employment in foreign companies at the end of 2001 was 9% compared with 5.8% of all employed 1999, 4.6% in 1996 and 1.3% in 1991. The share of foreign capital in the capital stock of all entities was 20% in 2000 compared with 17.6% in 1999, 9% in 1996 and about 3% in 1992. At the end of 2000, the greatest penetration of foreign capital (as measured by share of foreign capital in the capital stock) was in the following sectors: trade and repair (56%), hotels and restaurants (42.5%) and manufacturing (41.4%). The share of foreign capital in the assets of the Polish banking sector is currently about 70%. (Wojnicka, 2001; GUS, 2002)

Among the firms surveyed in the cluster mapping project, about 13.5% had foreign participation and these firms employed about 24% of all employees. Firms with foreign participation were thus over-represented in comparison with the entire economy. Since the firms for the survey were selected from the localities with the highest statistical probability of a cluster's existence, this may suggest that foreign capital is attracted by interesting concentrations of activities and that it may have a role in cluster building.

Among the localities surveyed, the most foreign firms were in the plastics concentration in Poznań, the capital of Wielkopolskie Voivodship situated in central Poland – 33% of the firms surveyed. However, this concentration does not show many cluster features. A full 25% of firms from the electronic concentration in Cracow in southern Poland also had foreign participation. However, this concentration is not a mature cluster either. More cluster features were shown by the electronic concentration in Warsaw where the share of firms with foreign capital is a little lower – 17%. As Table 5.9 shows, no clear correlation exists between the number of firms with foreign participation and the relative intensity of cluster features in the particular concentration. Nonetheless, apart from the plastic grouping, most of the concentrations with a higher than average share of foreign firms have quite a few cluster features while two concentrations without any foreign capital – leather concentrations –are also weak in terms of intensity of cluster features.

Table 5.9 Firms with foreign capital participation in the concentrations analysed

Concentrations	Location	Share of firms with foreign capital	Relative intensity of cluster features 1 = the most, 4 = the least[9]
Plastics-Poznan	Wielkopolskie Voivodship, central Poland	33%	4
Electronics-Cracow	Małopolskie Voivodship, southern Poland	25%	2
Food industry - Wielkopolskie	Wielkopolskie Voivodship, central Poland	20%	1
Pharmaceuticals and cosmetics –Warsaw	Mazowieckie Voivodship, central Poland, the capital	18%	1
Electronics - Warsaw	Mazowieckie Voivodship, central Poland, the capital	17%	1
Furniture - Poznań	Wielkopolskie Voivodship, central Poland	17%	2
Pharmaceticals and cosmetics -Cracow	Małopolskie Voivodship, southern Poland	14%	2
Fish industry - Pomorskie	Pomorskie Voivodship, northern Poland	14%	1
Furniture-Olsztyn	Warmińsko-Mazurskie Voivodeship, north-eastern Poland	14%	2
Building-Poznań	Wielkopolskie Voivodship, central Poland	13%	2
Building - Lower Silezia	Dolnośląskie Voivodeship, south-western Poland	13%	2
Pharmaceticals and cosmetics - Łódź	Łódzkie Voivodeship, central Poland	8%	1
Food industry -Olsztyn	Warmińsko-Mazurskie Voivodeship, north-eastern Poland	7%	1
Textile industry-Bielsko-Biała	Śląskie Voivodeship - southern Poland	7%	3
Textile industry-Lower Silezia	Dolnośląskie Voivodeship, south-western Poland	7%	4
Furniture Oleśnica-Kępno	Wielkopolskie Voivodship, central Poland	0%	2
Leather - Słupsk	Pomorskie Voivodeship, northern Poland	0%	4
Leather- Radom	Mazowieckie Voivodship, central Poland	0%	4

Source: The Gdańsk Institute for Market Economics, the firms' survey

Foreign direct investments may create a stimulus for cluster building but so far no clear interest, either from investors or the Polish authorities, has been expressed. Foreign investors have been investing in the Polish special economic zones (SEZ) where they could receive tax exemptions (Ambroziak, 2003). Often, one such investment attracted other investments and many of the SEZs are now agglomerations of firms of a specific profile

like the aluminium firms of Stalowa Wola Subzone in Tarnobrzeska SEZ in south-eastern Poland (Jaślan 2002). The investors will stay in Poland partly if they have created strong and satisfactory co-operative linkages with domestic firms. There is some evidence that international firms present in Poland are developing co-operative linkages with domestic firms, but the presence of a local production system is rarely a reason for their decision to locate in Poland (Wojnicka, 2003). Foreign investors could play a huge role in the transfer of knowledge to the Polish SME sector but apart from natural spill-overs so far no public programmes exist to take advantage of the technology transfer potential of foreign firms in Poland.

Cluster policy

The policy framework

An official cluster policy is non-existent in Poland. However, current policies and institutions to support small and medium-sized enterprises can and could play an important role in fostering networking and clustering among Polish firms.

A policy supporting SMEs in Poland has been conducted since 1995, when the programme "Small and Medium-Sized Enterprises in the Nation's Economy" was initiated. The programme aimed to enforce many modern legal resolutions vital for both SMEs and other enterprises, such as the Banking and Tax Law, resembling those of mature market economies. Moreover, it assumed many financial, organisational, informational and advisory activities. Along with that programme, the National Fund of Credit Guarantee was established and there are now several such regional and local funds. The most important result of these developments was the establishment of the Polish Foundation for Small and Medium Enterprise Promotion and Development, which in 2001 was replaced by the Polish Agency for Enterprise Development.

Policies supporting SMEs in Poland are currently realised in two ways: Policies aimed at the creation of suitable conditions for operations and development of small and medium-sized enterprises and SME support as an element in labour market policy, regional policy or rural development policy. Policies are realised both at national and regional levels driven by EU membership. The main institution responsible for SME development on the domestic level is the Polish Agency for Enterprise Development (PAED), which also manages the networks of local supporting institutions (the National SME Services Network and Regional Financing Institutions).

Both public and private SME supporting institutions are well developed in the form of business incubators, centres for technology and information

transfer, loan-guarantee funds, venture capital funds, business support centres and technology parks, whilst penetration by banks is also growing. These institutions are an important component of the business environment that may stimulate the effectiveness of enterprises and interaction among them, thus enhancing clustering.

Platforms of dialogue and co-operation among firms are present in all regions of Poland: Chambers of commerce, chambers of commerce and industry, bilateral chambers, sectoral chambers and various associations and organisations. Trade fairs in Poland are topically diversified with the growth of fairs connected to the high-tech sector taking place in the major Polish cities. Specific to the Polish institutional landscape are special economic zones with a strong cluster potential.

SME support institutions

The Polish Agency for Enterprise Development (PAED) is a governmental agency subordinate to the Minister of Labour, Social Affairs and Economy. The objectives of the Agency include implementation of economic development programmes, especially in the areas of small and medium-size enterprises' development, exports, regional development, job creation, human resources development and counteracting unemployment, as well as promotion of modern technologies. Activities of the Agency are financed from the State budget and European Union funds.

The National SME Services Network (KSU) is a group of some 150 co-operating business counselling centres all over the country. Most of the member organisations are regional and local development agencies, business support centres, industrial and commercial chambers, and local foundations and associations; all of them are not-for-profit entities providing services directly to SMEs. These entities operate under an accreditation system of PAED, which guarantees maintenance of high standards in their services.

Regional Financing Institutions (RFIs) are the PAED's partners in the process of SME policy implementation. RFI has within its structure the Training Refund Centre (PRS) and the Consulting and Advisory Point (PKD). PKDs provide SMEs with free advice on administrative and legal aspects of running a business, as well as information on available sources of finance and access to services for the sector.

Another important part of the business environment are business and innovation centres, which may take different forms. Business and Innovation Centres (BICs) in Poland concentrate particularly on issues concerning regional and local development such as business counselling, arrangement of training courses, financial assistance in the form of credit or guarantee funds, and what is of prime importance, on technology transfer

and commercialisation. In 2003, there were 298 BICs in Poland affiliated to the Polish Business and Innovation Centres' Association. Some of them belong to the National SME Services Network.

There are 45 business incubators, 21 centres for technology and information transfer, 57 loan-guarantee funds, 29 venture capital funds, 142 business support centres and 4 technology parks. There are very few specific BICs connected with the profile of the concentrations analysed in the cluster mapping project. Most of them serve all kinds of enterprises. However Mazowiecki, Małopolski and Łódzki regions where the high-technology concentrations analysed are situated belong to the group of 5 regions where the most BICs connected with innovation and technology transfer (venture capital funds, technology parks and centres for technology transfer) are located. In Cracow and Warsaw - the cities where the electronic groupings analysed are located - specific funds for internet activity are also present. Business incubators which help newly established enterprises are located in six cities surveyed: Radom, Bielsko-Biała, Olsztyn, Słupsk, Warsaw and Łódź so they might enhance clustering in eight of the groupings analysed.

In Poland forteen special economic zones exist. These are industrial areas, having specific privileges, such as tax exemptions, which were created to accelerate the development of the country through the growth of employment and by attracting foreign capital and investors. More information on their role in cluster building will be presented in the section on international links.

Crucial for enterprise development are banks providing capital. Their local availability is important for clustering. In terms of density the most banks are in Lubuskie and Mazowieckie and the least in the poorest Polish regions: Świetokrzyskie and Podkarpackie. The average density of banking entities in Poland is 5.6 per 100,000 inhabitants, which means one branch per 17,700 people. The bank penetration rate in Poland is growing but is still much lower than in the most developed EU countries. In 1998, on average there was one bank branch per 21,400 people in Poland, while in Germany one per 1,600, in France one per 2,170 and in Italy one bank per 4,170 inhabitants. Local availability of banks in Poland however appears to be sufficient as the firms surveyed in the cluster mapping project use mainly regional banks.

Platforms for dialogue and co-operation

Corporate self-governance in Poland is being reborn. Its revival, after more than 40 restrictive years, came in 1989 under the Parliamentary Act on chambers of commerce. The Act spurred first regional and sectoral chambers, soon followed by bilateral chambers. The Polish Chamber of

Commerce, now affiliating 160 members, was established in 1990. It is the chamber of chambers and through its members brings together more than 500,000 companies active in Poland.

Chambers of commerce are present in each region of Poland, and usually there are more than one. The most chambers of commerce and industry are present in the Śląskie voivodeship. The main sectors with self-government are producers and operators of entertainment equipment, ecologists, the sugar industry, geodesy, the power industry, medicine, architecture, electrical engineering, advertising, overland transportation, construction design and construction, office and school equipment, electronics and telecommunication, recycling, artistic handicrafts, property protection, the packaging industry, motor industry, chemical industry, as well as pharmaceutics and tourism. In other regions there are chambers specific to the regional industrial profile such as the maritime chamber in Pomorskie voivodeship, the chamber of the furniture industry in Wielkopolskie voivodeship or chambers of the textile industry in the Łódzki region**.**

Specific chambers of commerce connected with the fields of activity of the firm groupings which were studied in the cluster mapping project are only found in Mazowieckie and Wielkopolskie voivodeships in central Poland. These are the electronics and pharmaceutical chambers in Warsaw in the Mazowiecki region, and the furniture and wood industry chambers in Poznan in the Wielkopolski region. The concentrations in Wielkopolski do much better than some other concentrations of the sector in terms of presence of specific chambers in the vicinity. Three specific chambers and organisations connected with the food industry are located in Poznań and this may be one of the reasons for a very good performance of the food industry's concentration in Wielkopolski region in terms of cluster features, although the other food grouping analysed (Olsztyn) also does well in these terms. The building concentration in Poznań also has a specific local chamber.

Bilateral chambers are chambers that group enterprises of Polish and foreign origin. These chambers reflect Polish economic relations with Israel, Ukraine, Belgium-Luxemburg, Brazil, Latvia, Germany, the Republic of South Africa, Lithuania and Sweden. Most of the bilateral chambers are in the Mazowieckie voivodeship – seven of them – as well as most of the sectoral chambers.

Another important platform for firms and other institutions' relationship building as well as knowledge transfer are trade fairs. Trade fairs gather different agents in joint activities during presentations and organisation of the fairs and exhibitions' events. Trade fairs also promote the economic

integration of regions as well as support the commercial co-operation of Polish and foreign firms. In 2001 there were 233 fair events, held in 15 towns, with approximately 30,500 exibotrs and 26 organisers (Polish Fairs Corporation, 2002). Of the concentrations analysed in the cluster mapping project, the following have their trade fairs in the locality of the concentration: pharmaceuticals and cosmetics in Łódź, information technology and pharmaceuticals in Cracow, the furniture industry in Olsztyn and building, furniture, food industry and plastics in Poznań. Thus half of the concentrations analysed are located in the vicinity of where their trade fairs take place.

Areas for improvement

A cluster-based policy *sensu stricto* is non-existent in Poland, although the cluster concept is gaining the attention of politicians and some cluster-specific measures are being introduced. Examples are the financial assistance programmes of the Polish Agency for Enterprise Development for SME consortia, as well as grants for consolidation or joint-ventures, setting up groups of producers or supply/trading networks for the creation of joint marketing etc (Marek, 2003).

As clusters differ from one another, the specific measures of any cluster-based policy should be adjusted to the needs and requirements of a specific local cluster. Some examples of locally-tailored recommendations for Polish clusters are:

- Recommendations for the development of high-technology clusters in the city of Gdańsk. These include the promotion of the cluster concept and 'co-opetition' (competition through cooperation) among firms, the improvement of existing regional business associations as knowledge transfer platforms and setting up new institutions that facilitate dialogue among various bodies, the improvement of the environment for entrepreneurship development – mostly in regional academia, the development of venture capital institutions and promotion of 'business angel' networks, and provision of better business information for firms, especially on European programmes and funds.

- Recommendations for the development of the potential printing cluster in Warsaw put forward by the authors of that analysis. They recommended first of all improvement of information transfer in the industry, and between industry and related branches, and local assistance aimed at integration and partnership in the industry and assistance in internationalisation of the firms, especially SMEs. One of the tools to achieve this could be an internet platform for the industry with information about and for the firms.

At the national level, authorities could implement measures to stimulate a transition towards an economy based on and perceived through local clusters, in dialogue with cluster representatives and local authorities. Although some cluster-like behaviour in Poland exists, firms do not perceive themselves as clusters. Thus promotion of this concept in practice could be the role of government and public business support institutions. This could be realised by distribution of knowledge about the cluster concept. Public support institutions could arrange special training for small and medium-sized entrepreneurs on 'co-opetition', which would also create an opportunity for firms to network.

National authorities could also encourage large firms, mainly foreign investors, to arrange special meetings and other exchanges with small firms. Small companies could learn from large companies, especially about new technology and global trends. Authorities could also implement fiscal incentives such as the possibility of waiving membership fees for cluster organisations.

All of the measures undertaken to build effective regional innovation systems - systems of knowledge transfer throughout the economy - would be in line with a cluster-based policy. Promotion of small firm consortia in public procurement could also be one of the measures of a national cluster-based policy. Preferably, these would be consortia with the participation of other institutions such as research organisations as in the EU R&D programmes. All policy enhancing public-private partnership and networking would also stimulate the transition towards an economy based on clusters.

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Endnotes

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7 powiat – a sub-regional territorial unit at the level of NUTS4 in European nomenclature, equivalent to British local administrative district or LAD.

8 The map also shows the regions of prior studies on traditional sectors from the empirical studies (Świętokrzyski and Lubelski).

9 The synthetic indicator of intensity of cluster features is based on a detailed analysis of the questionnaires and number of lacking features from the tables presented in the above sections.

Chapter 6

Hungary

by Gergely Gecse

The Hungarian chapter presents cluster evidence from the country's first mapping exercise, as well as data on government-sponsored clusters in Hungary in a great variety of economic branches. Foreign direct investment on the one hand and bottom-up responses to international competition on the other hand appear as the main driving forces of cluster development in Hungary. Current cluster policy with a cluster development, regional and SME approach is reviewed with a special emphasis on the necessity of using the cluster concept as a tool to bridge a growing economic development divide among Hungarian regions.

Local cluster mapping methodology

Even though to date a formal cluster analysis for Hungary has not been undertaken, the concept of clusters has been part of official Hungarian economic policy since the late 1990s. Under the Széchenyi Plan implemented in January 2001, intended to boost the Hungarian economy, Hungarian clusters received funding in an effort to support the domestic entrepreneurial community. Groups of firms could qualify for financial support if they complied with the following cluster definition and could fulfil a number of other requirements under the RE-1 programme (see section on 'cluster policy' for more details).

"Clusters are company alliances, which are based on geographical proximity. Clusters are driven by competition; the relationship among companies in a cluster is characterised by rivalry, harmonisation of common, local interests and by the existence of trust as social capital. Cluster enterprises are in informal contact. Their transaction costs can decrease by joint innovation adjusted to market needs through information flows within the network. With this, the competitiveness of enterprises or a given region rises."

This definition is compatible with the OECD-LEED cluster core definition.

In the following section, evidence of industry concentration is presented together with data on already working clusters, which mainly went through an application/tender process under the Széchenyi plan.

The analysis of industry concentration was undertaken using location quotients calculated on the basis of employment data. For this, Hungarian Central Statistical Office (HCSO) data for 2002 was used comparing county-country and region-country employment. In some exceptional cases, the criteria applied to identify industry concentrations (the location quotient should exceed 1 and there should be a minimum of 2000 employees in the concentration) were relaxed to allow employee numbers to vary between 1149 and 1985 people. These cases concern Northern Great Plain and Central Transdanubia Region (one each), Southern and Western Transdanubia (three each), well as the Southern Great Plain and Northern Hungary Region (four each). Clusters in the service sector were measured using qualitative case studies.

Numerous statistical problems pertaining to data availability, data depth and data estimation arose during the calculation of location quotients (LQs). Hungarian statistical data on regional (NACE II) level is rare, so it had to be deduced by summarising county data. Whenever possible, both county and regional data was used. Figure 6.1 shows the regions and countries used for the cluster mapping exercise.

Figure 6.1 Hungarian Administrative Structure: Regions and Counties



Source: Ministry of Economy and Transport, Innovation and Environmental Protection Department

The way data is classified (data depth) makes it difficult to distinguish the precise nature of an industry concentration, for example whether it falls under the category of an automotive or an electronics cluster. This is because data by company location refers to the county where the head office of the enterprise is located, irrespective of whether local units of production are located in the same county or not. As enterprises' head offices are mainly located in the Hungarian capital, this distorts results based on data collected on the county level.

Industrial production data of enterprises employing more than four people is given at the local level where production is actually carried out. This data was determined for the whole of industry employing the survey system and using estimates. Data for enterprises with 4-49 employees is often estimated, partially depriving us from grasping the "essence of clusters" using quantitative means only.

The clusters

The first part of this section discusses the industry concentrations identified in the cluster mapping exercise. The second part discusses officially recognised clusters.

Concentrations from the cluster mapping exercise

The industry concentrations identified in the cluster mapping exercise are presented below for each of Hungary's seven regions in turn. The Box below provides information to interpret the Tables. Shaded areas in the Tables mark those counties and sectors with a location quotient above 1, deemed to be the critical mass for cluster development. The dark shading refers to employment above 2,000 and the chequered shading to employment below 2,000 people. These shaded cells contain the identified clusters. The figures provided in the cells are the location quotients.

Western Transdanubia Region

Western Transdanubia, bordering on Austria, Slovakia, Slovenia and Croatia, features the third highest concentration of industry in Hungary, successfully attracting large amounts of foreign direct investment. It is home to the Pannon Automotive Cluster (PANAC), itself accounting for 10% of Hungarian GDP alone. In this region, five officially-recognised clusters are operating: The Pannon Automotive Cluster (PANAC, in the northern part bordering on Slovakia), the Pannon Wood and Furniture Industry Cluster (PANFA, located in the Zala county in the south), the Pannon Electronics Cluster (PANEL, in the centrally located Vas county), the Pannon Thermal

Cluster (PANTERM, near the border of Austria) and Pannon Fruit Cluster in the Vas county.

Table 6.1 Industry concentrations in Western Transdanubia

Sector and NACE code	Győr-Moson-Sopron county	Zala county	Vas county	Western Trans-danubia region
Food, drink, tobacco (DA)	0.89	0.90	0.69	0.83
Textiles & leather (DB-DC)	1.14	1.01	1.91	1.36
Wood, paper, printing (DD-DE)	0.57	0.99	0.86	0.77
Chemicals (DF-DH)	0.78	0.38	0.66	0.64
Mineral products (DI)	1.03	1.32	0.38	0.90
Metals (DJ)	0.75	0.41	0.51	0.59
Machinery (DK-DM)	1.31	1.27	1.28	1.29
Manufacturing n.e.s. (DN)	1.34	2.26	1.07	1.48
	= Concentrations with 2000 or more employees			
	= Concentrations with less than 2000 employees			

[10] See end notes for full sector descriptions. Figures in cells are location quotients.

In the textile and leather industry, location quotient results point to a higher than average concentration mainly due to the existence of the so-called "textile-quadrangle". The textile quadrangle connects Győr, Szombathely, Mosonmagyaróvár and Pápa (Pápa is situated in the Central-Transdanubia Region, the other towns are in the Western-Transdanubia Region).

There is a significant concentration of firms in the textile-leather industry in Győr, Mosonmagyaróvár (manufacture of knitwear, rayon), Zalaegerszeg, Szombathely, Körmend (manufacture of footwear), Sopron (manufacture of carpets and rugs) and Kőszeg. The textile sector has greatly benefited from the proximity of the border and the relocation of production from Western European countries. To date, it has not applied to be officially recognised as a cluster, although in the future it could receive support from the Pannon Business Initiative, a business network supporting local and regional firms.

The manufacturing sector features a high location quotient in all three counties of the Western Transdanubia Region stemming from a concentration in the furniture making industry. Indeed, Zala county, nearly 40% of it covered by forest, is home to the officially recognised Pannon Wood and Furniture Industry Cluster (PANFA).

The high concentration in the NACE category of machinery and equipment production stems from the significant presence of automotive (Győr - Audi, Rába, Szentgotthárd - Opel) and electronics companies

(Zalaegerszeg, Sárvár - Flextronics, Szombathely, Sárvár - Philips, Nagykanizsa - GE) in the Western Transdanubia Region.

Regional industry concentrations measured correspond largely to the officially recognised clusters. However, data used to identify industry concentrations could not account for the existence of the thermal or the fruit cluster. A high concentration in the textile and leather industry calls for a more detailed analysis, as it may hide a budding textile cluster.

Central Transdanubia Region

In terms of Hungarian industrial production, Central Transdanubia, bordering north on Slovakia comes second with 23.6%, showing above average industry concentrations in wood/wood products and paper, the chemical industry, glass and porcelain manufacture, metal, as well as machinery and equipment production. In this region, four officially recognised operating clusters exist: The Central-Hungary Automotive Cluster in the northern part close to the border with Slovakia Esztergom Cluster (or Central-Hungary Automotive Cluster), Pápa Meat and Food Industry Cluster (located in the western part of the region) Central Transdanubia Wood and Furniture Industry Cluster and Central Transdanubia Electronics Cluster (both in the centrally located Fejér county).

Table 6.2 Industry concentrations in Central Transdanubia

Sector and NACE code	Komárom-Esztergom county	Veszprém county	Fejér county	Central Trans-danubia region
Food, drink, tobacco (DA)	0.83	0.74	0.51	0.66
Textiles & leather (DB-DC)	0.34	0.68	0.27	0.41
Wood, paper, printing (DD-DE)	1.10	0.58	0.43	0.65
Chemicals (DF-DH)	1.23	1.35	0.66	1.03
Mineral products (DI)	1.52	3.21	0.52	1.57
Metals (DJ)	0.89	1.42	2.01	1.54
Machinery (DK-DM)	1.26	0.84	1.56	1.27
Manufacturing n.e.s (DN)	0.27	0.90	0.57	0.59
Manufacturing (D)	0.97	0.98	0.97	0.98
= Concentrations with 2000 or more employees				
= Concentrations with less than 2000 employees				

See end notes for full sector descriptions. Figures in cells are location quotients.

In addition to its automobile manufacturing in the town of Esztergom clustering around the Japanese company Suzuki in Komárom, the northern part of the region features a concentration in the paper industry stemming from paper (Lábatlan) production and printing activity (Komárom). It also is

home to the chemical industry, the high industry concentrations accounting for the presence of pharmaceutical and agro-chemical industry. Veszprém county in the west features above-average concentrations in chemical industry, in the manufacture of glass, china, tiles and ceramics (Herend, Veszprém) and in aluminium production.

Fejér county hosts one of the most successful transition towns of central and eastern Europe, Székesfehérvár, that has attracted such internationally known companies as Videoton, Ford, Denso, IBM, Philips, Bosch and Albacomp to central Hungary. It is also home to steel and aluminium production. Significant concentrations in manufacturing can also be found in and around Tatabánya, which was successful in attracting the Swedish firm Ericsson.

Summing up, industry concentrations in metal production and manufacture of equipment back up the officially recognised Automotive and Electronics Clusters of Central Transdanubia. Further research needs to be undertaken to map possible connections among different industrial branches (chemicals, metal production, glass and ceramics and the electronics industry, for example) and among the automotive and electronics cluster themselves.

Southern Transdanubia Region

In terms of industrial production, Southern Transdanubia, sharing a border with Croatia and Serbia and Montenegro in the south, comes last with 6.1%, underlining the divide that exists between economically strong and weak regions. It hosts just one officially-recognised cluster, the Southern Transdanubia Regional Geothermic-Energy Development Cluster in its southern part. Southern Transdanubia features above-average industry concentrations in the food, textile/leather, manufacture of machinery and equipment, as well as wood production sectors.

Somogy county on Lake Balaton in the west of the region is home to a flourishing food industry (sugar, meat, milk products, wine and fruit juice) that has been able to attract international companies, such as Danone to Marcali and Henkel&Söhnlein to Balatonboglár. Next to the food industry, the manufacture of machinery and equipment is clustering around the town of Kaposvár in Somogy county welcoming the North American Bus Industries, Videoton, as well as Philips (Tab, Kaposvár, Fonyód).

Table 6.3 Industry concentrations in Southern Transdanubia

Sector and NACE code	Baranya county	Tolna county	Somogy county	Southern Trans-danubia region
Food, drink, tobacco (DA)	0.90	0.59	1.19	0.90
Textiles & leather (DB-DC)	1.64	2.18	1.55	1.77
Wood, paper, printing (DD-DE)	0.99	0.52	1.05	0.87
Chemicals (DF-DH)	0.61	0.25	0.40	0.44
Mineral products (DI)	1.85	0.35	0.36	0.95
Metals (DJ)	0.78	1.39	0.76	0.95
Machinery (DK-DM)	0.66	0.69	1.01	0.78
Manufacturing n.e.s (DN)	1.27	0.59	0.35	0.79
Manufacturing (D)	0.95	0.88	0.99	0.94
= Concentrations with 2000 or more employees				
= Concentrations with less than 2000 employees				

See end notes for full sector descriptions. Figures in cells are location quotients.

All three counties in the region have above-average concentrations in the manufacture of textiles and textile products and leather and leather products. Again, international firms have chosen to outsource parts of their value chain to this Hungarian region, such as Mustang Jeans to the town of Marcali in Somogy county, or Samsonite to Szekszárd and Salamander to Bonyhád, both located in the Tolna county. Pécs in the south has traditionally been centre for the manufacture of leather and gloves.

The concentrations in the textile and leather industry need more detailed analysis, as there is possibly a textile cluster. Also, the food industry, especially the production of wine and champagne might have cluster potential. Lastly, the wood production shows cross-regional links with the neighbouring Zala county of Western Transdanubia.

Central Hungary Region

Budapest, the economic powerhouse of the country claims the lion share (16.2%) of industrial production of Central Hungary (23.9%). So it comes as no surprise that the area around the capital hosts all four officially recognised clusters of the region: The Hungarian Building Industry Cluster, the Quality Development Cluster (or ÉKE-Macro TQI Cluster), the Saxon Export Cluster and the University Cluster. Budapest is home to a large agglomeration of factories in the manufacturing sector such as Sony, Orion, GE, Samsung, and NABI among others. The high concentration in Budapest in the paper/printing sector stems from significant publishing and printing activities and paper production. Budapest and the surrounding Pest county host a very strong chemical industry, producing pharmaceuticals, plastic products, refined oil products, glue, as well as photochemicals. Vác in the north of the region is a big centre of the chemical industry. No evidence

could be found to statistically back up the officially-recognised clusters in Budapest. However, the unusually strong concentrations in the chemical industry, especially among pharmaceutical companies may be associated with clustering.

Table 6.4 Industry concentrations in Central Hungary

Sector and NACE code	Pest county	Budapest	Central Hungary region
Food, drink, tobacco (DA)	1.03	0.81	0.89
Textiles & leather (DB-DC)	0.36	0.56	0.49
Wood, paper, printing (DD-DE)	0.96	2.00	1.63
Chemicals (DF-DH)	1.26	1.73	1.56
Mineral products (DI)	1.04	0.46	0.67
Metals (DJ)	1.07	0.90	0.96
Machinery (DK-DM)	1.28	0.93	1.06
Manufacturing n.e.s (DN)	0.84	1.00	0.94
Manufacturing (D)	1.03	1.01	1.01
	= Concentrations with 2000 or more employees		
	= Concentrations with less than 2000 employees		

See end notes for full sector descriptions. Figures in cells are location quotients.

Southern Great Plain Region

This region, bordering on Serbia and Montenegro and Roumania, with its distinctly agricultural character comes second-last with 7.8% of industrial production. It can look back on a long tradition of being Hungary's breadbasket producing cereals, poultry and pigs, as well as wine. Csongrád, the central county of the region features four officially recognised clusters: The Southern Great Plain Textile Industry Cluster, the Southern Great Plain Road Construction Cluster, the Southern Great Plain Tourism Cluster, as well as the Southern Great Plain Handicraft Cluster.

The production of food products (processing and canning of fruits and vegetables), as well as wine and champagne production has attracted multinationals such as Heinz, Unilever, Bonduelle, St. Laurent, Pompadour, and Walton Champaign. The region is also very strong in grain mill and bakery products as well as meat processing. The textile industry is also very present in all three counties with factories in almost every larger town (Kalocsa, Baja, Kiskunfélegyháza, Kecskemét, Kiskunhalas (lace), Szeged, Csongrád, Hódmezővásárhely, Szentes, Békéscsaba), supporting the official recognition of the Southern Great Plain Textile Industry cluster that links together textile-industrial enterprises in the region.

Table 6.5 Industry concentrations the Southern Great Plain

Sector and NACE code	Bács-Kiskun county	Csongrád county	Békés county	Southern Great Plain region
Food, drink, tobacco (DA)	1.69	1.54	1.84	1.69
Textiles & leather (DB-DC)	1.23	1.20	1.55	1.31
Wood, paper, printing (DD-DE)	1.11	0.63	1.02	0.94
Chemicals (DF-DH)	0.84	1.13	0.60	0.86
Mineral products (DI)	0.27	2.51	1.45	1.27
Metals (DJ)	0.82	0.66	0.55	0.70
Machinery (DK-DM)	0.80	0.49	0.60	0.65
Manufacturing n.e.s (DN)	1.06	1.94	1.29	1.39
Manufacturing (D)	1.03	1.00	1.04	1.02
	= Concentrations with 2000 or more employees			
	= Concentrations with less than 2000 employees			

See end notes for full sector descriptions. Figures in cells are location quotients.

However, apart from the Textile cluster, the other official clusters could not be mapped with location quotient data. Judging from the regional industry concentration evidence, there might be great potential to develop a wine and food cluster in the Southern Great Plain Region.

Northern Great Plain Region

This region, with its 10.1% of industrial production, part of the economically weak part of Hungary, shares common borders with Ukraine in the north-east and Roumania in the east. Three official clusters are operating in the Northern Great Plain Region: The Great Plain Economy-Development Cluster (AGKlaszter) and the Great Plain Thermal Cluster, both located in western Jász-Nagykun-Szolnok county, and the Mátészalka Optomechatronical Cluster near the Roumanian border in the east. The Northern Great Plain Region shows above-average industry concentrations in the manufacture of food products, textile, chemicals and the manufacture of machinery and equipment.

The food industry is present throughout the region with the production of vegetable oil in Martfü, meat processing in Szolnok, milk products in Jásztej, Kuntej, Milli), food canning in Debrecen – Deko, Nyíregyháza), as well as tobacco production in Debrecen – Reemtsma.

All three counties host the textile industry and the manufacture of footwear, attracting companies such as Salamander to Martfű in Jász-Nagykun-Szolnok county. The chemical industry in the Szabolcs county in the northeast, including the production of rubber (Taurus), lubricants and oils, pharmaceuticals and detergents (Unilever), accounts for above-average industry concentrations in the region. The high value in the production of

machinery and equipment would endorse the officially recognised AGKlaszter, which incorporates the manufacture of agricultural machinery (Claas), (Lehel - Electrolux), Samsung – Jászfényszaru.

Table 6.6 Industry concentrations the Northern Great Plain

Sector and NACE code	Jász-Nagykun-Szolnok county	Hajdú-Bihar county	Szabolcs-Szatmár-Bereg county	Northern Great Plain region
Food, drink, tobacco (DA)	0.89	1.47	1.62	1.34
Textiles & leather (DB-DC)	1.35	1.63	1.69	1.57
Wood, paper, printing (DD-DE)	0.73	0.85	1.78	1.14
Chemicals (DF-DH)	0.55	0.85	0.81	0.74
Mineral products (DI)	0.54	0.19	0.33	0.35
Metals (DJ)	0.94	0.73	0.39	0.67
Machinery (DK-DM)	1.25	0.76	0.62	0.87
Manufacturing n.e.s (DN)	1.22	0.66	0.67	0.84
Manufacturing (D)	1.03	1.00	1.03	1.02
	= Concentrations with 2000 or more employees			
	= Concentrations with less than 2000 employees			

See end notes for full sector descriptions. Figures in cells are location quotients.

Northern Hungary

Northern Hungary, bordering on Slovakia in the north, leads the second tier of Hungarian regions with 9.4% of industrial production. To date, there is no officially recognised cluster in the region, which shows above-average concentrations in the manufacture of basic metals in all three counties pointing to a long tradition in metallurgy in the region. In addition, it features concentrations in food production (wine, sugar and tobacco production in the Heves county), wood and wood products in Nógrád county which is the most woody area in Hungary with nearly 42% of it covered by forests, glass/ building materials (Nógrád), chemicals (Borsod-Abaúj-Zemplén county), as well as manufacture of machinery and equipment in Heves county where Bosch has set up shop in Hatvan.

Table 6.7 Industry concentrations in Northern Hungary

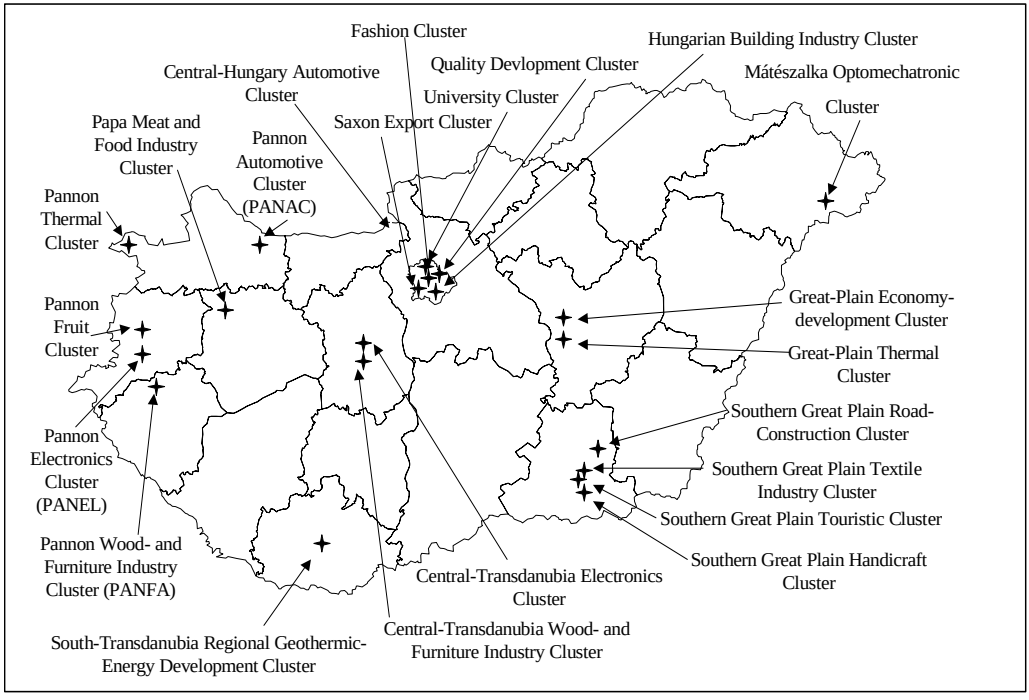
Sector and NACE code	Nógrád county	Borsod-Abaúj-Zemplén county	Heves county	Northern Hungary region
Food, drink, tobacco (DA)	0.59	0.93	0.94	0.87
Textiles & leather (DB-DC)	0.92	0.87	0.74	0.84
Wood, paper, printing (DD-DE)	0.65	0.48	0.47	0.51
Chemicals (DF-DH)	0.47	1.88	0.40	1.18
Mineral products (DI)	3.15	1.06	1.22	1.51
Metals (DJ)	1.58	1.83	1.25	1.62
Machinery (DK-DM)	0.99	0.55	1.15	0.81
Manufacturing n.e.s (DN)	2.32	0.54	0.83	0.97
Manufacturing (D)	1.02	0.94	0.92	0.95
	= Concentrations with 2000 or more employees			
	= Concentrations with less than 2000 employees			

See end notes for full sector descriptions. Figures in cells are location quotients.

Officially recognised clusters

Figure 6.2 shows the officially recognised clusters in Hungary, in which specific policy support is available for cluster building.

Figure 6.2 Map of officially-recognised clusters in Hungary as of 2003



In 2003, there were twenty-two officially recognised clusters operating in Hungary. Those clusters come from a wide variety of sectors, but are mainly based on traditional industry: automotive, wood and furniture, electronics, thermal, food products, building material, textile, tourism and optics.

According to the location quotient data exercise, only ten of the twenty-two officially recognised clusters corresponded to industry concentrations at county or regional level. It must be recognised however that the concentration data is not sufficient to fully identify clusters, which may operate at a different scale or involve important cross-sectoral links not picked up by the location quotient analysis. More importantly, the concentration data showed the presence of further potential clusters such as the textile clusters in Western Transdanubia, Southern Transdanubia and the Northern Great Plain Regions, as well as potential food-industrial clusters in the Southern and Northern Great Plain Regions that did not figure in the list of officially-recognised clusters. The first official clusters started to work in the economically more developed regions in the north-west, where there is a strong correlation between regional economic activity enterprise density and cluster–locations (Western Transdanubia, Central Transdanubia and Central Hungary).

Cluster policy

Cluster development programmes

In 2000, the Orbán government elaborated the Széchenyi Plan, named after a famous 19th century Hungarian count and economic reformer. This was a strategy document outlining priorities for economic development to improve convergence with the European Union by mobilising the business sector and the regions.

The plan, according to which the state would co-finance implementation of development projects, did not encompass all areas of the economy, but for efficiency reasons concentrated on key priorities. It promoted enterprise support, regional economic development, housing construction, tourism, research and development, highway construction and infrastructure development. By concentrating 2-3% of Hungarian GDP on defined goals, it intended to set the Hungarian economy into motion, particular through the mobilisation of the domestic entrepreneurial community.

The Széchenyi Plan introduced a number of SME measures that are linked to cluster support, including a measure for the creation of networks among SMEs and a Subcontracting Programme designed to upgrade the participation of Hungarian SMEs in the value chains of international

manufacturing firms. However, for the main part the Széchenyi Plan did not explictly focus on cluster development.

Nonetheless, the regional economic development sub-programme of the Széchenyi Plan, aimed at combating Hungary's regional inequality, has a strong focus on SME development at regional level. One of the regional development programmes introduced was the Cluster Development Programme (RE-1).

The aim of this programme was to take international experience and local constraints into account when facilitating the establishment of clusters. Assistance was made available to groups of firms organised on a regional basis, comprising commercial and non-commercial organisations, through the development of various support activities.

The most important instruments of the programme were an organisational system involving support for the establishment of cluster management and the establishment of related information systems, as well as initial support for the operation of cluster management, services supplied and their development. The government contribution was focused on the establishment of the appropriate initial conditions for the development of a limited number of local clusters. The underlying assumption was that the government would provide only seed money, meaning that clusters should be self-sustainable in time. All state support was considered just an additional resource in the process of building a cluster. Applicants could be enterprises (with Hungarian headquarters and legal status), foundations, non-profit enterprises and consortiums of the above-mentioned actors.

Clusters could gain a grant of up to approximately EUR 100,000, covering a maximum of 50% of the total cost of cluster establishment. Applicants were to contribute 25% of the total cost from their own resources and had to provide a bank guarantee for the total sum of support gained.

Although studies on clusters show that top-down policies aiming to build clusters from scratch are often unsuccessful, public intervention has played a catalyst role in supporting budding clusters. Seen in this light, the Cluster Development Programme may be considered a suitable cluster-building model in Hungary. Of course this does not mean that clusters would not and will not emerge without official support, but the Cluster Development Programme aimed to significantly accelerate this process. During the existence of the programme from 1 January 2001 to 2 August 2002, thirteen projects were allocated a total of approximately EUR 1.2 million.

The most important results, apart from the birth of these officially-sponsored clusters, was a change of mindset with regard to network-type co-

operation, helping SMEs to work together and building social capital from below. Of course, the programme design, especially the process of tendering, was far from perfect, with problems notably arising from the difficulties of gaining financial guarantees, the impact of lobby effects and misunderstandings about the cluster concept in general, to name just a few. Every tender winner had to provide a bank guarantee matching the money gained. Four clusters were unable to provide this guarantee: The Pannon Automotive Cluster (PANAC), the Mátészalka Optomechatronical Cluster (MOK), the University Cluster and the Pannon Thermal Cluster, as the Hungarian legal system did not foresee for a system of collective financial guarantees. In addition, the lobby power of certain actors did not allow for a level playing field in the cluster tender process, a problem very difficult to remedy, at least in the near future. Also, misunderstandings regarding the cluster phenomenon led to some unusual applications. And lastly, some applications that showed distinct cluster characteristics such as the Tállya Wine Cluster unfortunately did not qualify for funding under the programme, as it excluded co-operatives from gaining support.

After successful inception of the programme at the beginning of 2001, a first national cluster conference organised by the Ministry of Economic Affairs to take stock of cluster developments in Hungary took place in Esztergom on 21 February 2002, home of the first Hungarian cluster, the Esztergom Central-Hungary Automotive Cluster. Practically all Hungarian cluster leaders, researchers and policy makers connected with clusters participated in this event, which greatly impacted on the state of the art of clusters in Hungary. However, most of the presentations unfortunately touched upon the "theoretical background" of clusters. On the one hand, this helped to further clarify the cluster concept, on the other hand, this shed light on an unfortunate tendency in Hungary to concentrate on theory at the expense of practical aspects of cluster development. Nevertheless, first-hand experience of Hungarian clusters was presented, which helped to stimulate further research, as well as the establishment of other clusters. In addition, the conference provided a platform for networking and exchange of experience among the many actors of cluster development (cluster managers, research institutes, policy makers etc). This event was followed by a cluster seminar in May 2002, co-organised by the OECD LEED Programme and the Prime Minister's Office featuring international expert presentations and workshops.

The second national cluster conference took place on 19 November 2003 in Budapest. It was organized by the Ministry of Economy and Transport and the Federation of Technical and Scientific Societies (METESZ). Beside the dominant theoretical questions, discussions arose

about the most burning questions (e.g. financial problems) and about best practice.

When the Széchenyi Plan officially came to an end with the change in government in 2002, the support for clusters was continued in the framework of the Technology Development and Innovation Plan of the Ministry of Economy and Transport. The most important goals for the near future are the clarification of the legal status of cluster associtations, introducing a special cluster type to the Act CXLIV of 1997 on Business Associations, and the set-up of a cluster committee to co-ordinate cluster development.

Cluster development in Hungary is also shaped by EU enlargement and Hungary's entitlement to receive EU funding. The general aim of the European Union's regional policy is to reduce regional disparities within the Union and strengthen economic and social cohesion. In order to achieve this goal, the European Union provides support for Member States and regions that are underdeveloped (GDP per capita below 75% of EU average) through the Structural Funds and the Cohesion Fund. Critical to the process is the preparation of a strategic planning document for a planning period defined by the EU, the so-called National Development Plan (NDP).

In conformity with EU requirements, there are only a few Operational Programmes in the National Development Plan of 2004-2006, such as the Human Resources Development Operational Programme (HRDOP), the Environmental and Infrastructure Operational Programme (EIOP), the Regional Operational Programme (ROP), the Agriculture and Rural Development Operational Programme (ARDOP) and the Economic Competitiveness Operational Programme (ECOP). The cluster topic is included in the ECOP. In this context, clusters were integrated into the ECOPs' investment promotion, technological modernisation of the corporate sector and into its environment protection component. Resources available to fund these measures between 2004 and 2006 total EUR 33 million, although clusters will receive only a small part of the total support available. In 2004 cluster development was financed by the "B part" of the ECOP-2004-1.3. tender. The tender helps the establishment of new clusters. Enterprises with legal personality in the processing industry can gain a maximum of approximately EUR 100,000.

Three cluster initiatives that receive policy support from the Cluster Development Programme are outlined below.

Examples of publicly-supported cluster initiatives

Pannon Automotive Cluster (PANAC) initiative

Cluster description

PANAC, as a pilot cluster project in Hungary, was founded in December 2000. The founding document, a Letter of Intent for Co-operation was signed by Hungary's five most prestigious automotive companies (Audi Hungaria Ltd, Opel Hungary Ltd, Hungarian Suzuki Inc, LuK Savaria Ltd, Rába Automotive Holding Plc), representatives of financial and advisory service provider companies, and the West Transdanubian Regional Development Council.

The PANAC project was supported by the Ministry of Economic Affairs. For the initial stage of its operation PANAC received approximately EUR 125,000 contributing to the general operating and programme costs during the first two-and-a-half years of operation. During the same time period the West Transdanubian Regional Development Council contributed approximately EUR 48 million to the costs.

The cluster officially started its operation in June 2001, when it accepted the first round of membership applications. From the first moment, the companies showed great interest towards this new form of collaboration. Companies mainly view PANAC as a lobby instrument of the global sub-contracting industry. Here they can learn about the requirements, be visible to the major buyers represented in the cluster and get acquainted with the right person they should talk to in order to build out new business contacts. On the other hand, the buyers were also interested because they could receive controlled information on a much larger pool of potential suppliers than they knew previously.

Although companies interested in the Hungarian automotive industry had formed several associations, and other types of organisations, these could not achieve the required level of communication among the different types of companies. PANAC is determined to fill this gap and play a co-ordinative role among the parties.

PANAC views this as a critical task in its efforts to strengthen the automotive industry in Hungary. This industry is already one of the most important sectors of the Hungarian economy. It represents over 13% of the total industrial production. The export orientation of this sector is around 90%. The fact that this extremely high ratio is not only true for the final products, or more complex modules produced by the big multinational companies, but also stands for the automotive components sub-sector as well highlights what is probably the main problem of this sector: domestic

subcontracting and/or co-operation links are almost completely missing among the players

PANAC's operating form and operation

The co-ordination office of PANAC operates as a division of the Western Transdanubian Regional Development Agency Non-profit Company. It currently employs 2 people, the cluster manager and an assistant. Its offices are located in the INNONET Innovation and Technology Centre at the Győr Industrial Park.

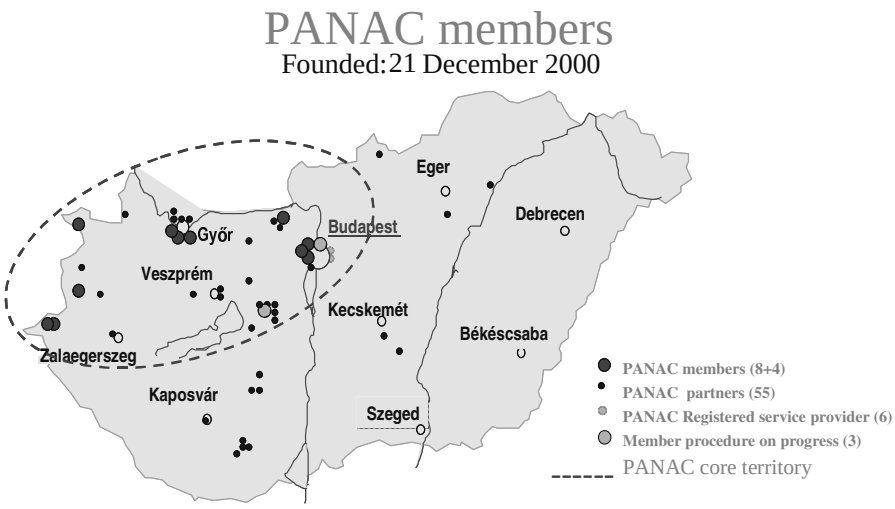
PANAC's operation and its activities are overseen by an executive board comprising representatives of the founding organisation and the Hungarian Ministry of Economic Affairs, with voting rights, and representatives of the companies in the cluster core, with consultation rights. Among the partners of PANAC there are four distinguished groups. These are the founding companies and organisations; the companies joined to the cluster core; the partner members, and the registered service providers. All of these companies are included in the cluster database that contains in-depth information on the companies. In addition to the founders, every company signs a bilateral contract with the PANAC Division. At the time of registration, companies are obliged to pay a one-off registration fee. This amounts to approximately EUR 120 for small and medium-sized enterprises, EUR 240 for large companies, and EUR 380 for service providers. Starting from the second year of their membership there is a yearly flat service fee that amounts to EUR 120.

PANAC membership

Although PANAC was established as mainly a regional initiative, it has outgrown the borders of West Transdanubia. Currently it operates with a national focus, aiming to be a co-ordinating power for the Hungarian automotive industry. PANAC currently has 73 members. The following diagram shows the geographical distribution of the partners.

As the result of the significant concentration of the automotive industry in North Western Hungary a significant majority (76%) of the PANAC members represent this region, referred as the core-area of PANAC. As a very important addition to the cluster-core companies, the Széchenyi István University of Győr joined the cluster in 2001.

Figure 6.3 PANAC cluster



The partner mix of PANAC is very heterogeneous. Ranging from micro enterprises to large companies with couple of thousand employees, every size category is well represented in the partnership. The most typical automotive technologies and activities are also present in the network. The membership is also well balanced from the point of view of different levels of the automotive supply chain. By having all these different type of companies on a common platform, and through cluster activities fostering intense communication among the partners, PANAC is fulfilling one of its main tasks, bridging the various companies with wide-range of experience, and thus promoting knowledge and know-how transfer.

PANAC's goals and tasks

The mission statement of PANAC emphasises that the main focus of its operation is to embed the companies operating with global capital in Hungary into the nation's (or even more the Central-East European region's) economic structure, through increasing the level of their interaction with the local economy. This can be achieved through an improved ability of the Hungarian owned companies to supply them with more complex products, as well as through the improvement of their economic environment, providing them with state-of-the-art services. In order to meet these goals PANAC is involved in the following activities:

- Assessing, summarising and continuously monitoring the automotive requirements for suppliers.

- Developing an evaluation tool that can be used to assess the abilities of the companies to meet the required level.
- Continuously monitoring global trends and assessing their effects on local industry.
- Communicating requirements and trends among the network members.
- Organising conferences and professional forums.
- Developing an information and communication portal on the internet (www.panac.hu) and publishing a monthly e-newsletter and a quarterly professional publication.
- Developing small and medium-sized enterprises to help them achieve the necessary standards.
- Providing specialised training and services.
- Introducing state-of-the-art management and production techniques.
- Working closely with educational institutions, universities, and R&D organisations and fostering their interaction with the industrial partners.
- Mediating reliable business information among partners on their needs and abilities (partner-matching).
- Being involved in one-on-one meetings, organising business forums, or representing the companies at international fairs.
- Assisting companies to enter into co-operation projects and joint business activities.
- Promoting and assisting joint purchasing, sales or marketing techniques to be able to utilise synergies.
- Assisting companies to join European wide co-operation projects.
- Building partnerships with international cluster organisations.
- Participating in European network projects.

- Based on the information gathered through the above activities, communicating with state and regional governments, indicating the needs and potentials of the industry.

Achievements

Beyond the 73 official PANAC members, a larger group of approximately 100 companies has also been set up. These companies also receive information on the PANAC activities on a regular basis. PANAC is now known as a reputed information centre for the Hungarian automotive industry.

Over the last two years, approximately 800 employees of PANAC's partner companies have participated in the 78 training days that were organised by the cluster. PANAC is also co-ordinating an Automotive Benchmarking Club to foster inter-company learning. The club has company members of every size, from multinationals to very small companies. Through the organisation of five automotive conferences and technology forums (150 companies, 290 participants), and three international business forums (47 Hungarian and 35 German and Austrian companies) the Pannon Automotive Cluster helped establish direct business relationships, providing the participants during these events with opportunities for personal meetings. PANAC has also represented its members at four international subcontracting fairs (Leipzig 2002-2003, Linz 2002, Paris 2002.)

Pannon Wood & Furniture Industry Cluster (PANFA) initiative

Cluster description

Wood is the main and most valuable natural resource of the Western-Transdanubian Region and its economic structure is dominated by the wood industry, with as many as 700 wood and furniture industrial manufacturers operating in the region.

The Zala County Foundation for Enterprise Promotion (ZMVA) initiated and 15 founding members finally determined to create a co-operation agreement with the support of the Ministry of Economic Affairs. This established a co-operative network in the wood and furniture industry. By this ceremonial act, the Pannon Wood and Furniture Industry Cluster came to existence in June 2001.

According to operational rules of the cluster, the strategic tasks of the Pannon Wood and Furniture Industry Cluster have to be processed by the cluster committee of 15 members. Three larger sub-committees have also been established to support the work of the cluster committee. These are the marketing, innovation and technology committees. Suppliers and small

enterprises have their own sub-committees of six people each. The cluster's management organisation is a non-profit organisation called ZMVA where a management of two together with all the other workers of the organisation carries out the professional tasks related to the realisation of the cluster's goals. New members have to be recognised by the cluster committee. Membership is free of charge.

Development trends in the domestic wood and furniture industry

One of the largest and most important natural resources of Pannon Region is wood, which is very characteristic of the landscape. The wood industry has become one of the most significant industrial sectors in the region after several years of stagnancy. There are two major advantages for firms in the region: raw material and proximity of state borders. The yearly 4-5% growth rate of Hungarian economy, the increase in house constructions and in domestic consumption also facilitate the development of furniture industry. Foreign trade has shown a dynamic increase and because of foreign investments furniture enterprises have integrated to the international economy very fast, whilst innovation, quality and design have improved.

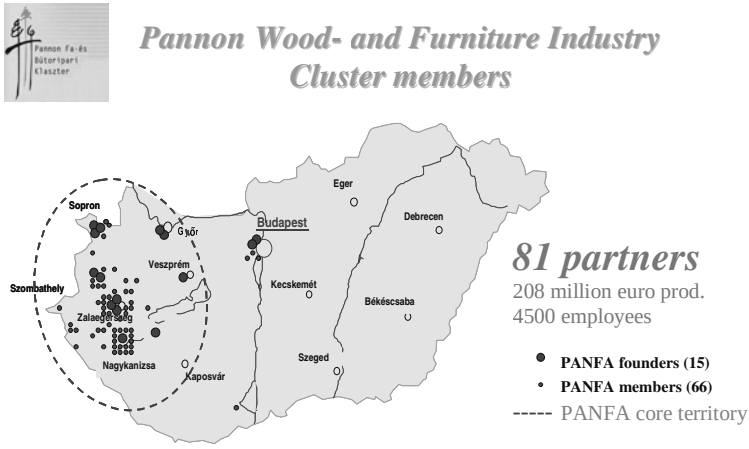
Operation

The cluster could come into existence because the working organisation's implementation study had a positive outcome. It identified an effective form of organization and determined the service needs of wood and furniture industrial enterprises in the region. The most important task is to ensure financial resources for the operation of the clustering activities. ZMVA as a legal entity is therefore aiming to create these financial conditions as a priority, working with governmental regional, local and Phare competitions. These resources are supplemented by enterprise contributions and the income from certain services provided by ZMVA.

Membership

Presently, the Pannon – Wood and Furniture Industry Cluster has 81 members. The following diagram shows the geographical distribution of the partners.

Figure 6.4 PANFA Cluster



The three counties of the Western Transdanubian Region: Győr – Moson – Sopron County, Vas and Zala County and Veszprém and Somogy County would like to expand this co-operative network to all of the 700 wood and furniture enterprises in the region in order to promoter competitiveness, innovations and the workability of domestic wood property.

Objectives

The Wood and Furniture cluster set the following objectives after having assessed the enterprises' demands and the organisation's operational conditions:

- Set up a regionally-integrated wood industry economic development model.
- Develop the co-operation network of small and medium sized businesses.
- Achieve high-level utilisation of the region's natural resources.
- Develop R&D, quality, product certification and marketing services.

Tasks

Industry-science links. One of the cluster's most important tasks is to establish contacts between the business and the scientific world. Two main expectations serve as basis for this activity: to increase productivity and to use high technology processes in competition. Networking can provide a

strategic solution for overcoming the challenges of competition by providing services that the wood and furniture enterprises demand.

Meetings, visits and fairs. Business meetings help to build contacts between Austrian, Slovene, Italian and Hungarian business representatives from the member enterprises. The experts and professionals can discuss the latest issues and share new information concerning the industry during conferences. The cluster also organises Italian, Austrian and Slovenian workshops. Cluster members are able to visit innovation and research centres as well as best practice projects. The cluster also helps its member enterprises either to visit national or international fares or to exhibit. This will promote the members' marketing activity.

Common information system. In the interest of modern and fast information exchange, the cluster has started its own web page with the support of the local municipality and the Zala County Chamber of Industry and Commerce. The members of the cluster are afforded the possibility to appear on the website. The cluster's own website is also available at www.panfa.hu. Cluster members also receive a monthly newsletter that summarises the latest information.

Common publications: The publication of Pannon Wood and Furniture Cluster is published three times a year. Usually new cluster members introduce themselves in this publication. The cluster's common furniture catalogue has also reached completion, describing the region's furniture supply.

Plans

In order to expand its range of services the cluster is planning a huge joint investment. The cluster plans to build a Wood-industrial Innovation and Technology Centre in the city of Zalaegerszeg at first stage. This centre and the nearby industrial park shall be supplied with energy by a biomass power plant that will be heated with wood waste. A further plan is to create a common cluster product, "pannon furniture", and trade it commonly on the market. This plan is in accordance with the local traditions.

Achievements

During the process of establishment of networking co-operation, which took up the first two years since cluster establishment, as many as 81 member enterprises have already allied within the framework of the cluster and work together effectively. Several conferences and meetings were organised where businesses had the opportunity to develop their international connections. The cluster had provided its members with financial and professional aid to facilitate regular participation at national

and international fares and exhibitions. Additionally, the cluster organised professional sturdy tours to Italy and Austria. In short, we can say that the Pannon Wood and Furniture Industry Cluster managed to raise the interest of a meaningful number of wood and furniture enterprises for conscious co-operation within just 2 years.

Pannon Business Initiative (PBI)

On 16 October 2001, the Western Transdanubian Regional Development Council, the Regional Tourism Committee and the West-Pannon Regional Development Company established the Pannon Business Initiative (Pannon Gazdasági Kezdeményezés – PBI).

The objective of the Pannon Business Initiative (PBI) was to establish a co-operative partnership between regional and economic development organisations to increasingly involve both private funds and assistance from international financial institutions in regional development. At the same time, it provides a joint regional platform for the automotive, wood, electronics, thermal and fruit clusters. The PBI supports the implementation of the 'enterprise innovation' priority of the regional development programme, creating the framework for network-based economic development in Western Transdanubia. The Pannon Business Initiative makes it possible to include SMEs in network-based co-operation, thus extending the scope of enterprises and contributing to the economic dynamism of the region.

The Pannon Business Initiative strives to achieve a well-organised, regionally-integrated economic development model with effective operation and functioning, thus promoting the region's general competitiveness in the long run. This is reflected in the founders' objectives for the Pannon Business Initiative, which should strengthen social and economic cohesion in the region, establish an attractive, innovative economic environment in Western Transdanubia capable of economic renewal and set up an organisational structure to strengthen networks outlining a clear division of labour among participating organisations. The Pannon Business Initiative aims to actively promote a network-like development of those regional sectors with a competitive advantage, as well as to enhance integrative links among regional clusters fostering their compatibility and interoperability. Lastly, it aims at defining regional economic priorities with regard to the distribution of state subsidies.

The Pannon Business Initiative as a network integrates and links the clusters operating in the region, such as the Pannon Automotive Cluster (PANAC), the Pannon Wood and Furniture Industry Cluster (PANFA), the Pannon Electronics Cluster (PANEL), the Pannon Thermal Cluster

(PANTERM) and the Pannon Fruit Cluster. The operative, organisational tasks of the Pannon Business Initiative are carried out by the Western Transdanubian Regional Development Agency, a non-profit entity. Participants in the Pannon Business Initiative exchange ideas on regional economic development on a regular basis.

In addition to the founders, membership of the Pannon Business Initiative extends to the region's industrial parks, business centres, chambers of artisans and commerce, county employment centres, associations, non-profit organisations and, naturally, cluster organisations themselves. A regional economic internet-based portal of the PBI supports the maintenance of contacts as well as the achievement of plans and tasks. The portal site, besides carrying information about the organisations involved in the development of the region's economy and regional sectoral clusters, can be regarded as a form of electronic customer service. It intends to act as a gateway to the region's investment opportunities and programmes and organises various calls for proposals, as well as providing economic information. The site is linked to the Western Transdanubian site, the database of the region's industrial parks, as well as to the respective portals of the five officially-recognised clusters in the region (automotive, wood, electronics, thermal, fruit) and to the electronic database of the Pannon Business Initiative. In order to attain the goals set by the PBI, extensive exchange of information and co-operation is required among the various regional organisations (artisan chambers, employment centres, business centres and all organisations involved in economic development). The portal aims to promote innovative economic development in the region through its databases and network opportunities.

International links

Hungary is a relatively small country (93,000 km^2) with a very open economy. Every settlement is within 80 km of the nearest border. In this section, international cluster links, be it through foreign direct investment or through cross-border co-operation among clusters will be presented.

Foreign direct investment has played an important role in fostering cluster development in Hungary. Nearly 27,000 trans-national corporation (TNC) affiliates are now operating in Hungary with a steadily increasing workforce (about 600,000 employees in 2000). The most important sectors for FDI are motor vehicles, electronics equipment and trade. Interestingly, the number of employees in Hungary is 30% higher than those employed by FDI affiliates in the Czech Republic, the second largest FDI recipient in the region.

Seven-tenths of foreign direct investment flows to greenfield sites, mainly to avoid having to form joint-ventures when acquiring an existing Hungarian firm, and driven by the necessity to create new industries from scratch, as many of the socialist era operations are obsolete and/or environmentally problematic. Although greenfield investment dominates, the positive trend from low value-added to high-tech investment is continuing and multinational companies in Hungary are increasingly introducing high added value activities such as distribution, marketing, research and development. Greenfield investment has also been responsible for the appearance of supply chains among Hungarian firms clustering around multi-national enterprises.

Another form of international link for Hungarian clusters involves cross-border partnerships among firms within clusters. However, taking into account the relatively short history of Hungarian clusters, their linkages with other clusters and/or firms in other countries are only in the process of taking shape. It is worth mentioning that Hungarian clusters are mainly modelled after their Austrian counterparts. This stems on the one hand from the fact that Austria has more than a decade of cluster policy practice and, on the other hand, because traditional connections link the two countries as manifested by a significant Austrian FDI presence in Hungary (12% of the total and third largest investor behind Germany and the Netherlands).

As an example of international networking, the Pannon Business Initiative maintains international contacts with regional development and cluster organisations in Austria, Germany and Italy. International exchange of experience and knowledge transfer is especially promising with regard to trans-border co-operation with the Lower-Austrian network (i.e. the LANCE project).

The LANCE project originated from the principle of "internationalisation" as the cornerstone of the Lower Austrian regional innovation strategy. Lower Austria initiated a network of key figures from the economic, administrative and research sectors to achieve an improved position of Lower Austria in Central Europe and to create a strong, competitive and economic "core region for Central Europe". This co-operation is intended to be an efficient instrument to satisfy the needs of Lower Austria and its neighbour regions and to transform common competencies into concrete actions. "Eco PLUS Ltd", the Regional Development Agency of Lower Austria, is entrusted with the realisation of this project.

The aims of the project are to provide information about the economy, the territory and the people in Central Europe and to gradually remove barriers in the minds of (business) people. Activities include co-ordination

between central European regions, thus avoiding duplications and bottle-necks, motivation of Lower Austrian SMEs to carry out cross-border economic activities, and support for business co-operation in the core region of Central Europe by information, co-ordination and motivation of business partners.

A Lower Austrian service manual provides information to Lower Austrian SMEs and interested people regarding the possibilities of doing business in the Central European reform states. The manual co-ordinates promotion measures for SMEs interested in cross-border activities. This service aims to motivate Lower Austrian SMEs to invest in cross-border activities by presenting successful initiatives and providing a catalogue of possibilities.
Finally, information activities, co-ordination and motivation of entrepreneurs are intended to contribute to the development of a "Central European core region". Project partners in the Czech Republic, Slovakia and Hungary are numerous.

In addition, two especially successful cases of cross-border co-operation exist between Hungary and Austria in the automotive and wood production branches. In the automotive branch, the Pannon Automotive Cluster actively co-operates with the Automotive Cluster Vienna Region (AVCR), AC Oberösterreich and AMZ Subcontractor Network (Saxonia). In the wood production branch, the Pannon Wood and Furniture Industry Cluster has a close connection with TecNetCluster (Holz Niederösterreich), organising joint conferences and study tours.

Further cross-border co-operation is also being supported by the EU Interreg programme. For example, the Southern Great Plain Textile Cluster is involved in co-operation with Roumanian partners in Nagyvárad. The co-operation includes a joint training base and conferences for SMEs in textile industry sector.

Areas for improvement

The first official clusters started to operate in the economically more developed regions in the north west (Western Transdanubia, Central Transdanubia and Central Hungary), where there is a strong correlation between regional economic activity and cluster locations. However, according to the regional concentration analysis, only ten of twenty-two officially-recognised clusters are also areas of high concentration at county or regional level. Although concentration at this scale clearly should not be the sole criterion for designating a cluster, it can be argued that cluster designations should take the results of future cluster mapping exercises more strongly into account. This is particularly important since the industrial

concentration analysis suggests the presence of a number of currently unrecognised potential clusters such as the textile clusters in Western Transdanubia, Southern Transdanubia and the Northern Great Plain Regions, as well as a potential food-industrial clusters in the Southern and Northern Great Plain Regions.

In Hungary, an economic policy framework exists fostering both regional development and SMEs. Support for clusters is a vital part of it. However, while progress has been made to encourage regional development and SME support via cluster support, there is room for improvement. Business and institutional actors need to be better made aware of the role of knowledge-based networking and of co-operation based on local resources to achieve competitiveness under conditions of increasing competition. Programme design needs to reflect the interdependence between policy areas such as regional development, SME support and the attraction of foreign direct investment and better involve the local level in building the links. Lastly, the cluster concept needs to be clarified and promoted at ministerial and departmental levels to improve policy interoperability.

Endnotes

[10] Full sector descriptions. DA: Manufacture of food products, beverages and tobacco products. DB-DC: Manufacture of textiles and textile products, leather and leather products. DD-DE: Manufacture of wood and wood products, manufacture of pulp, paper and paper products, publishing and printing. DF-DH: Manufacture of chemicals and chemical products. DI Manufacture of other non-metallic mineral products. DJ: Manufacture of machinery and equipment not elsewhere specified. DN: Manufacturing not elsewhere specified. D: Manufacturing.

Chapter 7

Czech Republic

by Zdeněk Mikoláš

This chapter presents cluster evidence from the Czech Republic. Czech policy to foster small and medium-sized enterprises by encouraging enterprise clusters and networks is introduced. Special attention is paid to the potential of an emerging cross-border cluster in the northwestern border region of the Czech Republic with Poland and Slovakia.[11]

Local cluster mapping methodology

Working definition

When defining the term "cluster" for the Czech cluster case study, the OECD LEED cluster core definition – "local concentrations of horizontally or vertically linked firms that specialise in related lines of business together with supporting organisations" – served as a starting point. Inspired by the European Commission's work on entrepreneurial clusters (European Commission, 2002) and enterprise network theory (Mikoláš, 2002), the core definition of "local clusters" was extended to include networks as well (see Box).

Cluster definition for the Czech case study

Clusters refer to groups of independent, while interdependent (alternately collaborating and competing) companies and associated institutions that are geographically concentrated in one or several regions, even though their cluster may have global reach. Entrepreneurial clusters specialise in particular lines of business, be it high-tech or traditional industries.

While clusters and networks are certainly distinct, it was observed that clusters, especially cluster support organisations very often carried specific network characteristics. Entrepreneurial networks are defined as formal and informal organisations that facilitate the exchange of information and technology and foster various kinds of co-ordination and collaboration in a cluster, for example chambers of commerce, trade associations or alumni networks of schools and companies.

Hereafter, "clusters" are referred to as "entrepreneurial clusters and networks (ECN)". This somewhat enlarged definition helped to trace clustering firms, with or without network-type support structures.

Cluster mapping methodology

Identification of entrepreneurial clusters and networks is usually based on four basic methodological approaches: input-output analysis; calculation of location quotients; quantitative and qualitative techniques to visualise particular networks/ clusters; and a combination of the above approaches.

The decisive feature of clusters is a greater intensity of contacts and collaboration going beyond informal relations among firms. From a geographical point of view, the entities of a cluster can be either concentrated in a small area (e.g. a micro-region) or they can be located far away from one another but be interconnected by very intense and rapid information flows. Special attention therefore needs to be paid to the possibility of clusters straddling statistical boundaries.

Unfortunately, cluster mapping in the Czech Republic is seriously hampered by a lack of data for many reasons. In the years 1989/90, dramatic changes took place in the political and economic system that impacted on data collection and data collection methodology. The "Velvet Divorce" dividing Czechoslovakia into two separate states, the Czech and the Slovak Republic in 1993 further complicated matters. A new system of statistical regions was introduced at the beginning of the 1990's, bringing the number of Czech regions up to fourteen (including Prague) since 2000. Tragic floods in the Czech Republic in the first half of 2002 destroyed some central databases so that alternative statistical resources needed to be exploited. Further data-collection and methodology-related problems also need to be mentioned.

Firstly, in an effort to alleviate the regulatory burden of small firms, enterprises with up to 20 employees were exempted from their statistical information duty. Information is now gained by other procedures, such as selected and conjunctural inquiries and database analysis. These methods distort statistical information as microfirms with 0 – 9 employees account for 97% of all entrepreneurial subjects in the Czech Republic.

Secondly, input-output analyses are currently undertaken only once every five years. Moreover, segment and sector analysis is carried out only at the national level. In the opinion of Professor Macek, VSB-Technical University of Ostrava, ZU Plzen, an expert in input-output analysis and statistical methods, data available from enterprises employing more than 100 employees is very reliable, with statistics from enterprises with more than 20 employees being fairly reliable. However, the above mentioned classification of economic subjects according to the Czech Statistical Office standards is not undertaken at regional level although the organizational and sectoral structures of particular regions are dynamically changing on a

constant basis. Statistical data in the currently available form therefore cannot grasp the continuous constitution of new networks, clusters and as other entrepreneurial activities.

After expert discussions, it was decided to abandon the use of input-output analysis in an effort to avoid working with distorted data. As an initial indicator of entrepreneurial clusters and networks in the Czech Republic, calcuation of location quotients was undertaken for all economic sectors in all 14 regions according to NACE terminology using 2001 data. Figure 7.1 shows the location of the regions analysed. This was undertaken for large and medium-sized enterprises only (with 100 or more employees and with twenty or more employees respectively) in order to avoid data distortions due to the under-representation of SMEs. Because these results excluded small enterprises, further analysis of SME sector concentrations was undertaken at the level of 89 counties, using data from SME associations in Czech counties and regions. The concentration analysis was supplemented by analysis of the impacts of the government supported KOOPERACE programme, which provides funding to associations of at least 15 SMEs, a survey of expert opinion and reference ot the results of previous cluster research.

Figure 7.1 Map of the Czech Republic with its fourteen regional capitals



Identifying clusters

The total number of enterprise clusters and networks in the Czech Republic, as well as their share of GDP and employment had not been monitored before the exercise for this publication. After measuring industry

concentrations and taking into account expert estimates, we can state with some certainty that existing associations, co-operations, networks, clusters, as well as firm alliances of all types account for about 60% of Czech GDP and employment. The main concentrations are identified below by region and sector.

Results by region

In Tables 7.1-7.3 industry concentrations are presented by region and sector. The overall results showed that sectors other than production industries, such as agriculture, construction, transport, trade and warehousing activities and repair were usually connected to clusters cores situated in the production sector. The results are therefore presented for cluster cores in production only.

In each table, industry sectors with cluster potential are identified involving large (L), medium (M) or small enterprises (S), or their respective combinations (L, M, S).[12] When marked with an asterisk, an industry branch has a gravity centre of cluster creation in a specific region.

Table 7.1 Regional concentrations in production industries

Sector and NACE	Prague	Central Bohemia	Western Bohemia	Southwest Bohemia	Southern Bohemia
Food, drink, tobacco (DA)	L M *	L M S *		L S *	L M S *
Textiles (DB)			L M *	M	L M S *
Leather (DC)					
Wood (DD)		S		S	L M *
Paper, printing (DE)	L M *				L
Coke and petroleum (DF)					
Chemicals (DG)					
Rubber and plastics (DH)		S	M	L M *	
Mineral products (DI)		L	L M S *	L	
Metals (DJ)		M S *		L	
Machinery & equipment (DK)		M S			L M
Electrical & optical (DL)	L M S			L *	
Transport equipment (DM)	S *	L *			L
Furniture (DN)	S		L M *	S	L
Mining and quarrying (C)		L	L *		L
Electricity, gas, water (E)					L

Industry sectors with cluster potential (location quotient>1) are identified involving large (L), medium (M) or small enterprises (S), or their respective combinations (L, M, S). A sector marked with an asterisk has its cluster centre of gravity within the region. Full sector descriptions are provided in the endnotes to this chapter.

Table 7.2 Regional concentrations in production industries

Sector and NACE	Northwest Bohemia	Northern Bohemia	Eastern Bohemia	Northeast Bohemia	Southeast Bohemia
Food, drink, tobacco (DA)	S				L S *
Textiles (DB)	M	L *	L M *	L M S *	L M S *
Leather (DC)				S	S
Wood (DD)					S
Paper, printing (DE)	L				
Coke and petroleum (DF)					
Chemicals (DG)			S	S	
Rubber and plastics (DH)	M	S	M	L	M
Mineral products (DI)	L	L M S *		S	L S
Metals (DJ)	S *		M S *		
Machinery & equipment (DK)			L M S *	L S *	L M *
Electrical & optical (DL)	S		L	L *	L
Transport equipment (DM)		L			L
Furniture (DN)		L M *			L
Mining and quarrying (C)	L *	L			
Electricity, gas, water (E)	L *			L M	M

Industry sectors with cluster potential (location quotient>1) are identified involving large (L), medium (M) or small enterprises (S), or their respective combinations (L, M, S). A sector marked with an asterisk has its cluster centre of gravity within the region. Full sector descriptions are provided in the endnotes to this chapter.

Table 7.3 Regional concentrations in production industries

Sector and NACE	Southern Moravia	Southeast Moravia	Northwest Moravia	Northern Moravia
Food, drink, tobacco (DA)	L M S *	S	L M S *	S
Textiles (DB)	S	M	L M S *	S
Leather (DC)		S *	S	
Wood (DD)		S		
Paper, printing (DE)	L		L	
Coke and petroleum (DF)				
Chemicals (DG)		S	S	S
Rubber and plastics (DH)		L S *	S	M
Mineral products (DI)	M		M	
Metals (DJ)	L M *	S *	L M S *	L M S *
Machinery & equipment (DK)	L M S *	L *	L M *	M *
Electrical & optical (DL)	L S *	L *	L *	
Transport equipment (DM)				
Furniture (DN)	L	L		S
Mining and quarrying (C)				L *
Electricity, gas, water (E)	L	M	M	L M *

Industry sectors with cluster potential (location quotient>1) are identified involving large (L), medium (M) or small enterprises (S), or their respective combinations (L, M, S). A sector marked with an asterisk has its cluster centre of gravity within the region. Full sector descriptions are provided in the endnotes to this chapter.

Prague

Prague, the economic hub of the country is home to several industry sectors with cluster potential, even though it does not account for very high concentrations of industry, a phenomenon mainly explained by its function as capital. Cluster potential can be found in the manufacture of electrical and optical equipment and in the manufacture of pulp, paper and paper products, publishing and printing. Strong cluster potential also exists in the agrofood sector grouping together large enterprises with 100 or more employees producing food products, beverages and tobacco. If we inspect small and medium-sized (and mico-) enterprises below 100 employees we see cluster-creative tendencies particularly in following branches: manufacture of transport equipment, manufacture of pulp, paper and paper products, as well as publishing and printing, manufacture of electrical and optical equipment, and manufacture of furniture and secondary raw materials. Industry links run across regional borders, especially in the food sector linking with agriculture in Central Bohemia (this industry branch is linked to trade as well). This also applies to the manufacture of electrical and optical equipment with links to other industrial branches in other regions and the trade sector.

Central Bohemia

Industrial production in this region is very asymmetric. Large enterprises dominate in the manufacture of transport equipment, manufacture of food products, beverages and tobacco, manufacture of chemicals, chemical products and man-made fibres, manufacture of non-metallic mineral products, mining and quarrying, and electricity, gas and water supply. The main cluster potential lies in the manufacture of transport equipment, which is linked to metal manufacture and metal products, business activities and repair services in the region and in the Czech Republic as a whole. The hub of this cluster is the only existing large enterprise in the region, the motor works in Mlada Boleslav. Besides the automobile industry, there is strong cluster potential in the complex of agriculture and manufacturing of food products, linked with a trade network going beyond the region. Especially strong links exist to the region of Prague. Small and medium-sized enterprises develop and create networks in metal products, business activities and repair services, under the influence of the automobile industry. Further SME cluster potential is evident in the manufacture of food products, beverages and tobacco with a link to agriculture.

Western Bohemia (Karlovy Vary)

The region possesses two cluster cores. The first is located in the mining and quarrying industry and the second in the manufacture of other non-metallic mineral products, especially glass, ceramics and china. In this sector large enterprises form the cluster core with SMEs connected to them. There is also a direct relation to the mining and quarrying branch forming an overall cluster characteristic to the region.

Southwest Bohemia (Plzen)

Large enterprises create two clusters in this region that extend to the whole area of the Czech Republic. The first is a large machinery cluster encompassing manufacturing of electrical and optical equipment, manufacture of transport equipment, and manufacture of basic metals and fabricated metal products, which overgrows into the manufacture of non-metallic mineral products (glass, china and ceramics) and manufacture of rubber and plastic products – especially in the sectors manufacture of basic metals and fabricated metal products and manufacture of furniture and secondary treatment, where the cluster is expanded by SMEs. The complex of the machinery enterprises in Pilsen forms the cluster core. The second large cluster is in food manufacturing, encompassing several branches, with beer production prevailing. With the beer brewery in Pilsen forming its core, the cluster gained a dominant position on the Czech market after breweries in the Pilsner Urquell Group and Radegast merged.

In addition to these two major clusters there are smaller clusters involving the textile products industry, where medium-sized firms prevail, and in wood and wood products and the manufacture of furniture, in which small firms dominate. Large enterprises dominate in the sectors rubber and plastics, glass, china and ceramics, manufacture of machinery and equipment and especially in manufacture of transport equipment and in electricity, gas and water supply.

Southern Bohemia (Ceske Budejovice)

In recent years, the region has transformed itself significantly with large enterprises forming clusters in several sectors. There is a cluster core in the region in agriculture and the manufacture of food products. In the sector of textiles and textile products both large firms and SMEs are active. The cluster in the manufacture of wood and wood products is connected with the manufacture of pulp, paper and paper products, publishing and printing as well as manufacture of furniture. Manufacture of machinery and transport equipment also create a strong aggregation. SMEs are involved in the clusters of the sectors manufacture of food products, beverages and tobacco,

manufacture of textiles and textile products, manufacture of wood and wood products and manufacture of machinery and equipment.

Northwest Bohemia (Usti nad Labem)

Mining, the manufacture of coke, chemicals, chemical products and the production of electricity, gas and water supply are important clusters with very large enterprises in dominating positions. Large enterprises are also found in the cluster centred on manufacture of pulp, paper and paper products, publishing and printing and in the cluster in glass, ceramics and china however these large firms have no significant influence on the development of SMEs networks in these areas. Medium-sized enterprises show cluster potential in the sectors of textiles and textile products and in rubber and plastic products. In this region, small enterprises carry a local cluster potential in the manufacture of food products, basic metals and fabricated metal products, and in the manufacture of electrical and optical equipment. In general, the regional industry structure is affected by the surviving complex of organisations connected to fuels and energy producing materials.

Northern Bohemia (Liberec)

Two regional cluster-forming branches dominate in the region. First, the manufacture of non-metallic mineral products, where both large and small and medium-sized firms play a role. Second, the manufacture of furniture. Large enterprises also bring cluster-potential to the manufacture of textiles and textile products and the manufacture of electrical and optical equipment sectors. Medium-sized enterprises dominate in the manufacture of fabricated metal products and in manufacture of glass products. Small enterprises show strong connections with the glass-making cluster. They are also important in the manufacture of rubber and plastic products and the manufacture of furniture.

Eastern Bohemia (Pardubice)

In this region, large enterprises form a cluster core in the manufacture of machinery and the manufacture of electrical and optical equipment, with SMEs grouping around them. The same effect can be seen in the manufacture of textiles and textile products. In contrast, SMEs dominate the manufacture of basic metals and fabricated metal products.

Northeast Bohemia (Hradec Kralove)

Large enterprises dominate the clusters in the manufacture of food products, manufacture of rubber and plastic products, manufacture of

machinery and especially in power supply, manufacture of transport equipment and manufacture of textiles and textile products. Enterprises of all sizes make up clusters in the textile and clothing industry, the manufacture of machinery and the manufacture of electrical and optical equipment. Small enterprises are very active in the manufacture of basic metals and fabricated metal products.

Southeast Bohemia (Vysocina)

The greatest cluster potential of in this region lies in the manufacture of food products and the manufacture of textiles and textile products, where enterprises of all size categories are equally represented. Large enterprises dominate in the manufacture of machinery, electrical and optical equipment and transport equipment. In those sectors, we also find a relatively strong cluster potential.

Southern Moravia (Brno)

The following sectors have cluster-creative potential: manufacture of food products, with the presence of enterprises of all sizes and manufacture of electrical and optical equipment. There is also a smaller group of firms in the manufacture of wood and wood products. Large enterprises dominate in the manufacture of basic metals and fabricated metal products, in manufacture of machinery and in manufacture of machinery and equipment. The manufacture of transport equipment, mining and quarrying and especially power supply have exceptional significance

Southeast Moravia (Zlin)

Significant cluster potential exists in the manufacture of rubber and plastic products, in which large enterprises have strong position and with connections to the manufacture of leather and leather products. The manufacture of basic metals and fabricated metal products, manufacture of machinery and equipment and manufacture of electrical and optical equipment account for the second cluster forming group. There also exists another group of sectors creating a cluster with specific regional character in the manufacture of wood and wood products and the manufacture of furniture. Large enterprises have a strong position in the region, especially in the following sectors: manufacture of leather and leather products, manufacture of rubber and plastic products, manufacture of machinery and equipment, manufacture of transport equipment and power supply. SMEs have a significant position in manufacture of wood and wood products, manufacture of glass, ceramics and construction materials, electrical and optical equipment and the manufacture of furniture.

Northwest Moravia (Olomouc)

There is strong regional cluster potential in the manufacture of food products linked with agriculture and in the manufacture of textiles and textile products, in which enterprises of all size categories are represented, with a significant role played by SMEs. Large enterprises form a cluster in the manufacture of machinery and equipment, which is connected with the manufacture of basic metals and fabricated metal products, and in the manufacture of electrical and optical equipment, in which SMEs dominate. However, the region also encompasses the economically very weak area of the Jeseniky Mountains and the large agricultural region of Hana where industrial development is limited.

Northern Moravia (Ostrava)

Large enterprises have an dominant position with regard to cluster potential in this region, namely in mining and quarrying, especially of bituminous coal, in the manufacture of transport equipment and power supply. In addition, large enterprises play a significant role in manufacture of machinery and equipment, manufacture of rubber and plastic products and manufacture of basic metals and fabricated metal products. There exists a "double-cluster", which is formed by two partial clusters: the energy cluster (mining and quarrying, electricity, gas and water supply, and manufacture of coke and refined petroleum products) connected to the chemical industry and the metallurgical-engineering cluster, encompassing the manufacture of basic metals and fabricated metal products and the manufacture of machinery and equipment. Latent cluster creation potential lies in the manufacture of transport equipment, not only because of existing enterprises but also because of the industrial zone in Nosovice village (30 km from Ostrava city) and industry connected to the air industry (in Mosnov near Ostrava). SMEs are concentrated in the manufacture of food products and the manufacture of textiles and textile products, as well as in the manufacture of basic metals and fabricated metal products, manufacture of machinery and equipment and manufacture of furniture.

Results by industry sector

The following Figures illustrate the concentrations with cluster potential by industry sector. The core locations of the clusters within the Czech Republic are marked by circles, with S indicating that small enterprises doinate, M indicating that medium enterprises dominate and L indicating that large enterprises dominate. There are no clusters in two production sectors: manufacture of coke and refined petroleum products and manufacture of chemicals, chemical products and man-made fibres.

Figure 7.2 Manufacture of food products, beverages and tobacco

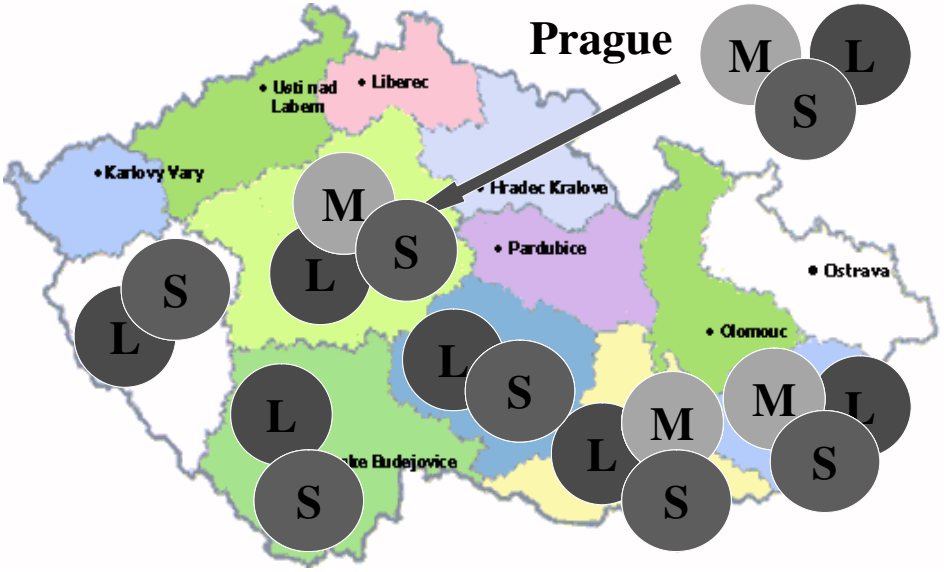


Figure 7.3 Manufacture of textiles and textile products

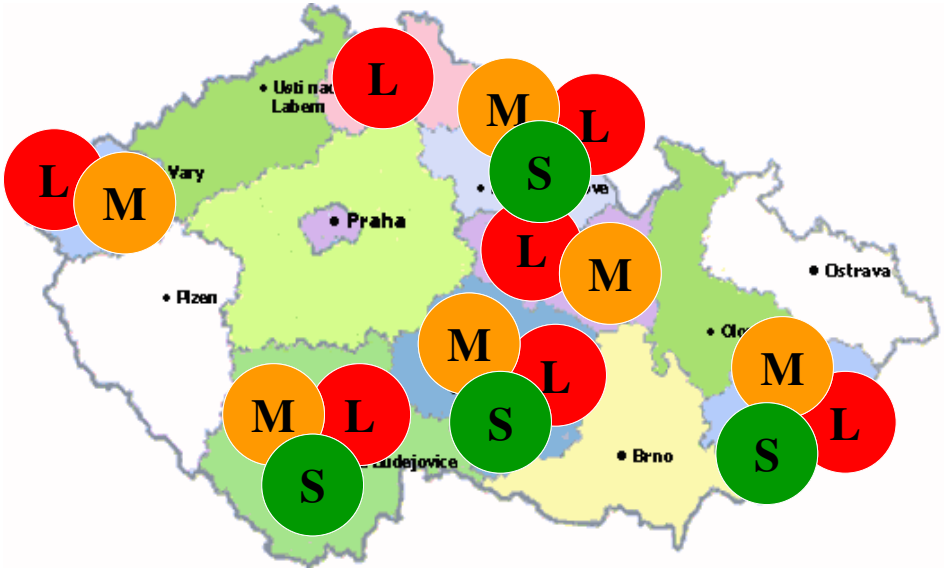


Figure 7.4 Manufacture of leather and leather products



Figure 7.5 Manufacture of wood and wood products

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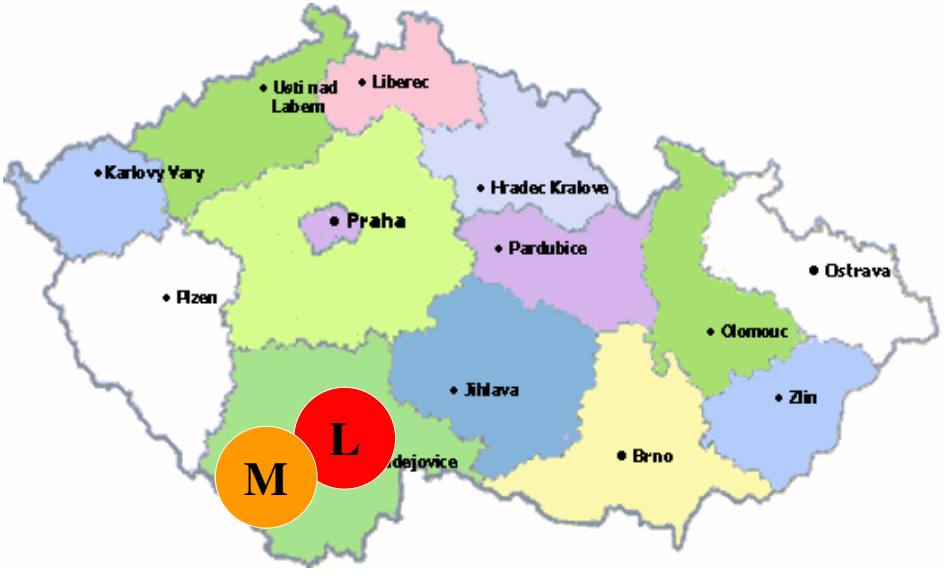


Figure 7.6 Manufacture of pulp, paper and paper products, publishing and printing

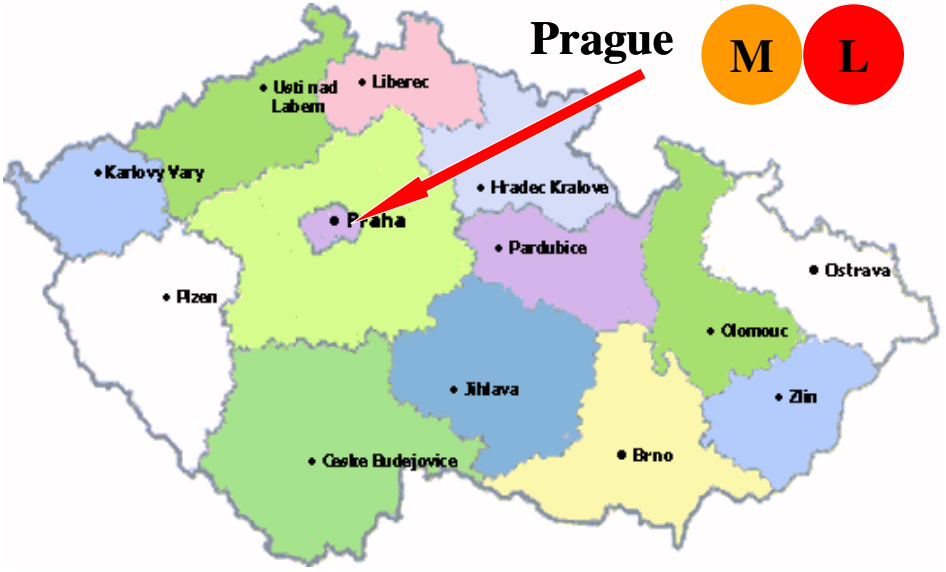


Figure 7.7 Manufacture of rubber and plastic products



Figure 7.8 Manufacture of glass, china and ceramics

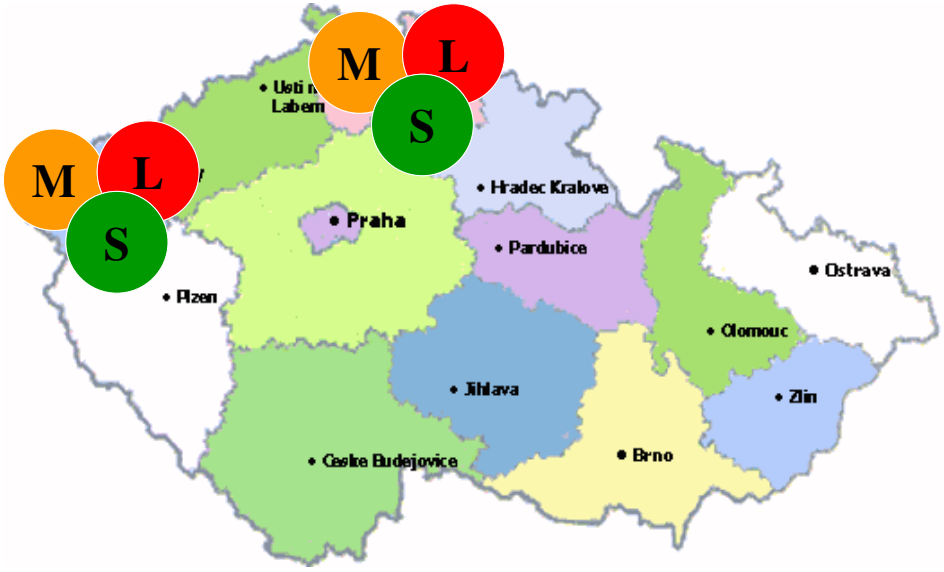


Figure 7.9 Manufacture of basic metals and fabricated metal products

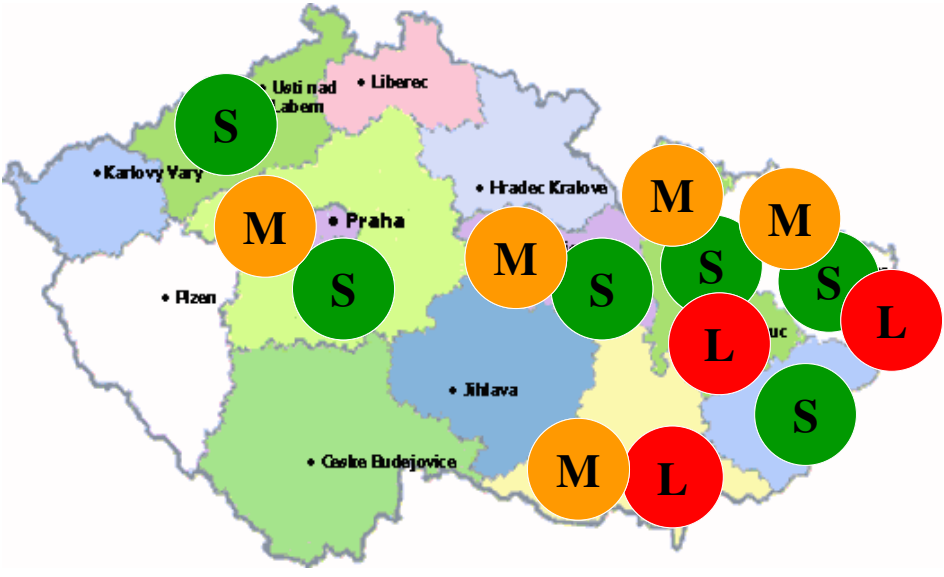


Figure 7.10 Manufacture of machinery and equipment

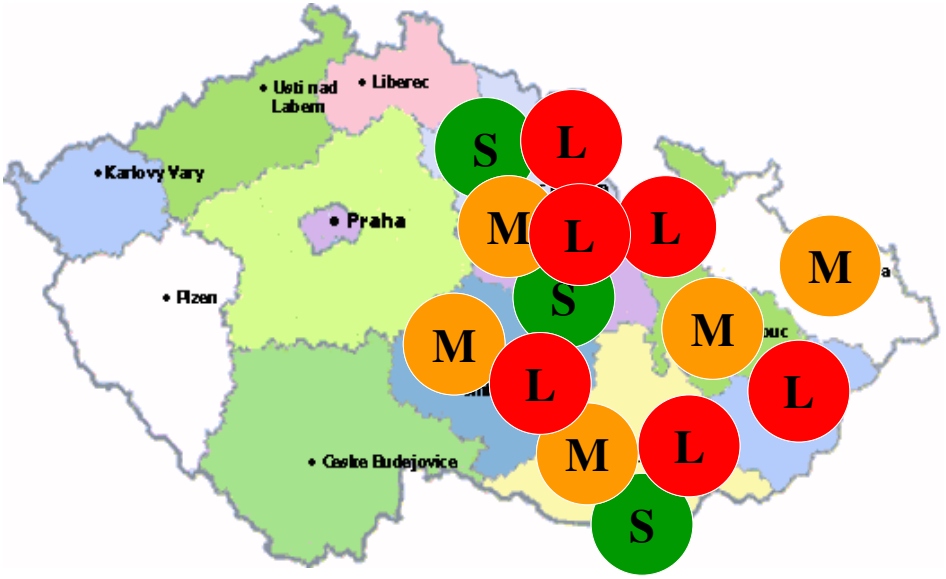


Figure 7.11 Manufacture of electrical and optical equipment

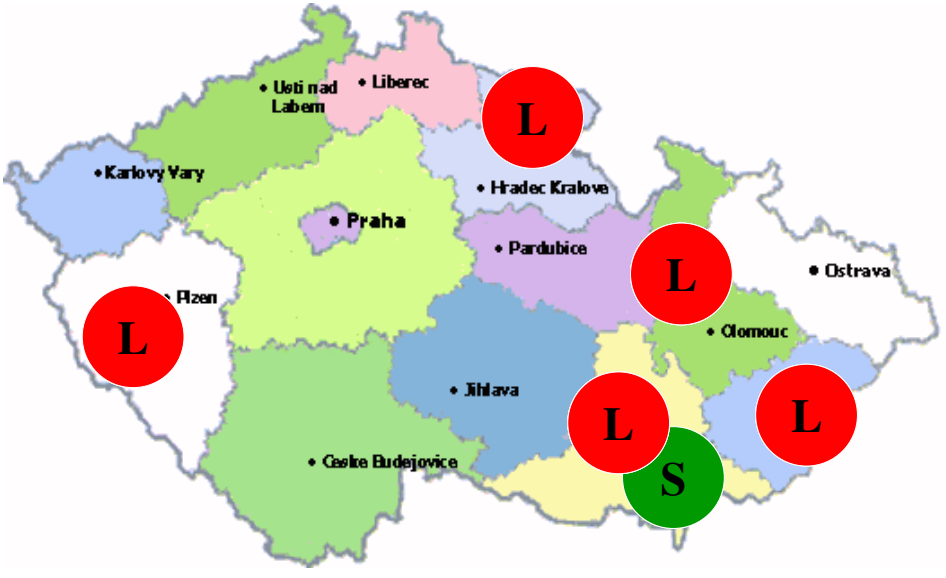


Figure 7.12 Manufacture of transport equipment

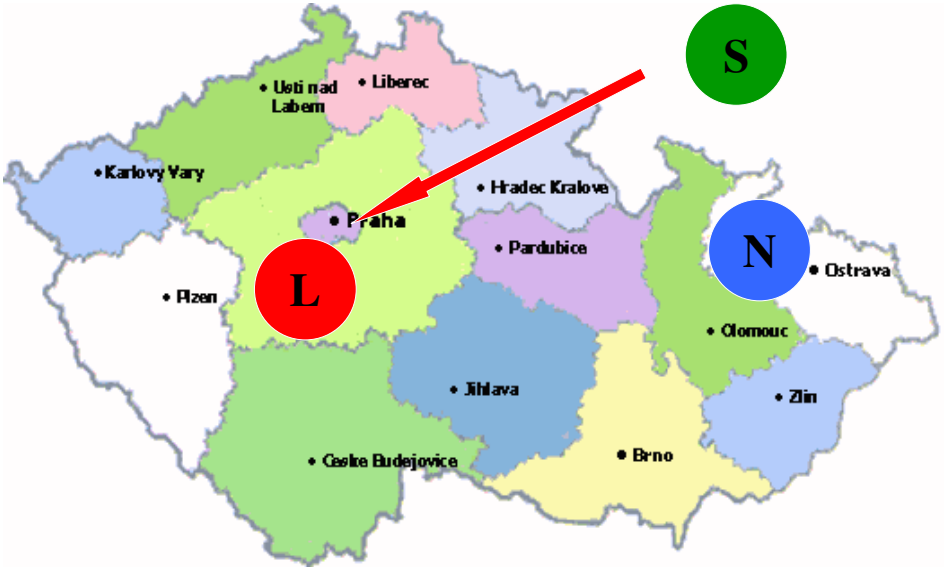


Figure 7.13 Manufacture of furniture and secondary treatment of materials

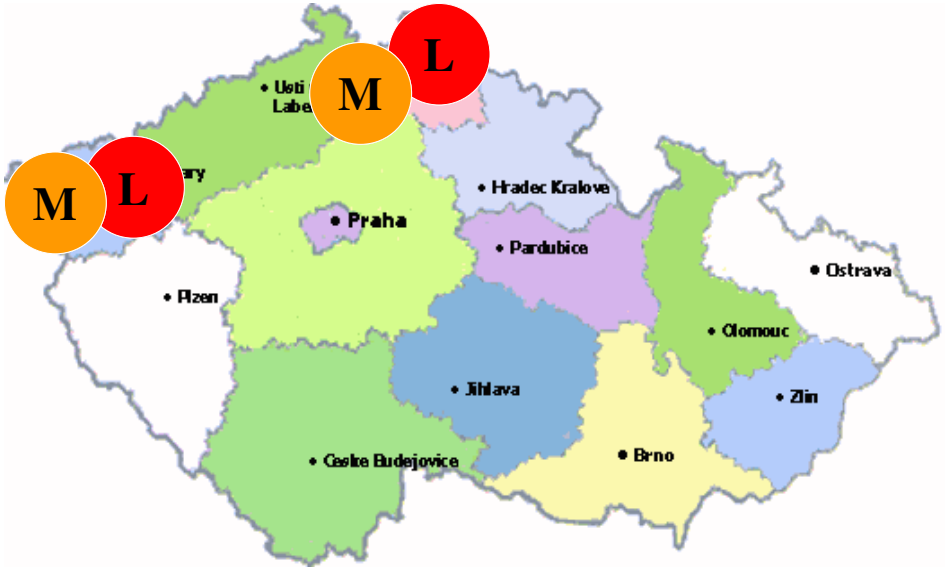


Figure 7.14 Mining and quarrying



Figure 7.15 Electricity, gas and water supply



Cluster types

In our analysis, we have identified three types of cluster, the "brownfield" cluster, building on Czech industry tradition often with the help of foreign direct investment, the "greenfield" cluster, whether foreign- or domestic-driven, and the "bottom-up" cluster, driven by SMEs seeking to respond to competitive pressures.

Brownfield clusters

In the past, the Czech Republic has had particular cluster strengths in the areas of metallurgy and mining, engineering and the textile industry. A typical example is the complex of coal mining, metallurgy and heavy engineering in North Moravia, which has been in existence for more than 150 years. These clusters are currently undergoing a process of transformation in the light of EU membership and globalisation. They can be labelled "brownfield clusters". Individual firm clusters often create multi-clusters on a higher level. An example from the present time are the inter-firm networks around the coal mining company OKD in Ostrava, including enterprises focused on coal mining and processing, and the metallurgical association Hutnictvi Zeleza in Prague, which coordinates the activities of metallurgical enterprises. These multi-clusters very often grow across regional boundaries to create so-called satellite clusters around a main cluster core. Some clusters have a countrywide character, the typical example being a network in the power supply industry composed of the Czech Power Company CEZ and related distributional and other utility companies.

After 1990, foreign investment started to play a role in these clusters. A typical example would be the creation of a country-wide network of suppliers, sellers and other enterprises linked to the SKODA automotive company, operating through a supra-national network of enterprises around Volkswagen group companies. The recent revitalisation of the brewery sector was marked by an entry of the South African Breweries into the Czech capital market, where a beer production and sales cluster reached a dominant market position. Each of these clusters builds on production structures from the times of the centrally-planned economy.

A "brownfield" cluster: The Ostrava metallurgy – coalmining cluster

Following the discovery of coal in the north-eastern part of the Czech Republic, in the Moravia-Silesia region, and the associated development of metallurgy, engineering, transport and construction, a network of enterprises and institutions gradually formed attracting a large agglomeration with about 1 million inhabitants. This agglomeration emerged approximately 150 years ago, with typical industrial cluster characteristics. In the second half of the 20th century, the cluster peaked employing about 200,000 workers and accounting for estimated 7% of GDP. At present, the cluster is undergoing progressive privatisation and has an estimated 60,000 employees and a 3% share of GDP.

A feasibility study has been undertaken to assess how the cluster could be supported by policy and to identify the regional industry groupings that should be targeted (Czech Invest and PE International, 2002). The study pointed to strong potential for the development of a metallurgy-engineering cluster, building on this industry's heritage in the region. At the end of 2002, at the encouragement of the Czech Ministry of Trade and Industry and the Czechinvest Agency, the Moravian-Silesian Engineering Cluster was constituted itself building on the historical roots of the region to compete or co-operate with large transnational corporations. At the beginning of May 2003, about 20 enterprises were involved.

Greenfield clusters

Two trends in greenfield cluster formation can be distinguished. Firstly, clusters form around the sites of large, often multinational firms. An example here would be the influx of major supermarket chains rapidly winning market share at the expense of smaller retailers. Alternatively, the dominant position of some international enterprises may provoke clustering of small firms as a competitive response to new market pressures. An example would be bakeries co-operating when negotiating supply relations with hypermarkets in a region.

A second form of greenfield cluster could emerge through the creation of industrial parks, in particular large industrial zones (about 2 to 4 km^2). A pilot investor, such as an automobile producer moving in to occupy the space can trigger a set of local and regional clusters in its wider locality. An example would be the industrial zone in Kolin near Prague and the prospective zone in Nosovice in the north-eastern part of the Czech Republic. According to a recent report on the business consequences of EU enlargement (McKinsey, 2002), the emergence of a supra-national automotive multi-cluster can be expected, located in Central Europe with a range of 200 km around its possible core in Nosovice within easy reach of Poland, Slovakia and Hungary.

A "greenfield" cluster: The Technological Park of Ostrava

This technological park is fostering a new trend in entrepreneurial network creation with the potential of creating a modern type of cluster whose cross-regional and cross-border operations are made possible by information and communications technology. The Technological Park of Ostrava (TPO) was jointly established by the municipality of Ostrava, three universities and the Agency for Regional Development of Ostrava. It is situated near the VSB-TU Ostrava campus on an area of 100,000 m^2. The municipality of Ostrava rents lots to the firms that want to settle in the TPO for a maximum of 99 years. In addition to infrastructure, real-estate and technical support, enterprises can also tap into the knowledge and information potential of the universities involved. The TPO is intended to have a virtual dimension allowing enterprises and institutions that are physically not situated in the TPO to be connected to it. It is an attempt to create a productive research network of enterprises and institutions in satellite shape. To reach its goals, the TPO decided to participate in the international project ACENET.

The purpose of ACENET is to enable a number of regions with common interests in cluster building methodology and in the fostering of cluster relationships to meet and jointly develop processes and methodologies for the establishment and management of clusters and networks as well as business opportunities for SMEs within and between clusters. The five objectives of ACENET are the fostering of cluster knowledge, regional cluster co-operation, the comparison of regional profiles, the facilitation of communication among network members and lastly, long term commitment for cluster development.

Bottom-up clusters

The third cluster type in the Czech Republic is clusters created by SMEs, developing through a bottom-up process of evolution. The Czech government and regional institutions support these processes of small firm cluster creation in various ways. One example would be the foundation of smaller industrial and technological parks (0.1–0.5 km^2) and the SME support provided by various national and regional programmes. To a certain degree, clustering by SMEs is a spontaneous process, characterised by considerable variation in levels of SME co-operation. As early as 1990, a network of craftsmen around the entrepreneur Cespivo spontaneously emerged. Later, a large SME network in the area of construction arose around the entrepreneur Miroslav Svarc from the town of Benesov near Prague. Some of these clusters (e.g. the Svarc system) were disbanded, as they violated social and health insurance legislation. An example of this type of cluster building is the SME network around the ŠIPKA co-operative in Moravian-Silesian region.

A "bottom-up" cluster: The ŠIPKA co-operative in Moravian-Silesia

The ŠIPKA co-operative is a well-established firm founded as a service, logistics and distributive centre, as well as a franchise currently co-ordinating more than 100 small and medium-sized quality businesses and shops with very good business ethics. The network is still growing by gaining new suppliers, thus creating a very dynamic formation that can be labelled an enterprise cluster. It was created as a direct reaction to the entrance of supra-national hypermarkets (Kaufland etc.) into the regino of Ostrava at the end of the last century.

The ŠIPKA co-operative was founded in 1998 with the purpose of collectively purchasing goods from manufacturers and suppliers in large quantities for the best price. The co-operative guarantees negotiated conditions of payment and delivery to its members, promotes common business policy and surres the legal protection of members. It focuses on development of production in its service area and supporting employment in the region. Members of the co-operative utilise the advantages of common purchase, sale, marketing and advertising. The network strategy of horizontal and vertical linkage is used in production and trade and vertical acquisitions are encouraged. A special effort is devoted to achieving discipline of payment of business owners while at the same time ensuring that those business owners will be able to meet their respective obligations towards banks and suppliers. The overall objective is to create a label under which the ŠIPKA trademark procures trust for buyers and sellers alike.

In May 2003 the co-operative counted 91 members.

Cluster policy

Many activities exist in the Czech Republic that are directly or indirectly connected with support for SME development in general and the creation of entrepreneurial co-operation in particular. The most important programme is the KOOPERACE ('co-operation') programme, implemented through the Czech-Moravian Bank of Guaranty and Development, which aims to link cluster development and support for SME associations. The approach is to provide a subsidy allowing an association of businesses to recover up to 50% of the cost of its co-operative and networking activities up to a maximum of EUR 90,000. Through this approach KOOPERACE supports the creation of various SME associations, such as networks, supply-chains and clusters.

According to the Ministry of Industry and Trade of the Czech Republic, as of April 2003 and from its inception in 2000, 75 applications had been granted support and EUR 7.4 million disbursed. Ten SME associations were supported in 2000, 26 in 2001 and 39 in 2002.

Some examples of co-operative SME networks supported by the programme are: Health instruments (a project focused on improving the marketing and buying position of associated firms); Hotels (an association supporting a unified strategy for advertisement and promotion); Medical and pharmaceutical equipment (a co-operation to improve conditions for buying materials and equipment, particularly dental, and negotiate favourable prices for medicines); Toy production (co-operation in marketing); Manufacture of furniture and other crafts; health food (promotion of specialised sellers); Association in co-operative societies (to achieve better supply as well as better conditions for the purchase of cash registers); consulting (an association of entrepreneurs and firms, e.g. tax advisors and solicitors, aimed at better informing potential clients of services available).

Groups of co-operating SMEs formed particularly in Prague and its surroundings (22 projects) and in Olomouc (Northern Moravia) and Central Moravia (19 projects), in the period from 2000 to 2002. There were relatively fewer projects in Southern Moravia (9 projects), in Northern Moravia and its surroundings (8 projects) and in Western Bohemia (6 projects). Only one project came about in Northern Bohemia. The surprisingly low number of projects in Eastern Bohemia, Southern Bohemia and in the Vysocina region on the border of Bohemia and Moravia is especially striking.

It is necessary to point out that most clusters (or other forms of enterprise co-operation) in the Czech Republic have an informal and unofficial character. Clusters are not systematically and statistically surveyed and monitored. SME clusters and networks supported by the national KOOPERACE programme therefore constitute an exception.

There is no one particular law or policy explicitly aimed at cluster creation in the Czech Republic. Rather, associations of firms, networks of enterprises and business alliances can access various forms of support. The overall government approach to cluster development is one of creating the right framework conditions to set clustering processes in motion. The Czech Ministry of Industry and Trade in conjunction with the Czech Ministry for Local Development play the main role in this regard, in co-operation with other Czech ministries, the Czechinvest Agency, the Agency for Enterprise Development and the Centre for Regional Development. Additional measures include the activities of regional development agencies and the use of subsidies to support the construction of industrial zones and technological parks.

In addition to creating the right framework conditions, encouraging SME associations of all kinds and supporting the creation of industrial and technological parks, the Czech government's intervention to reform the

metallurgy, heavy engineering and power industry has an indirect impact on cluster building. An example would be the establishment of the OSINEK special purpose vehicle, which is contributing to the transformation of the steelworks sector in the Ostrava agglomeration. A side effect of this government activity is the creation of a network of co-operating metallurgical and engineering enterprises improving their competitive position prior to privatisation.

At the end of 2002, activities aimed particularly at supporting clusters in the Czech Republic regardless of enterprise size were shifted to the Czechinvest Agency. Strengthened by a merger with some smaller agencies, Czechinvest has been well positioned to fulfil its government mandate to attract and embed foreign direct investment for the benefit of both foreign and domestic industry.

International Links

Given its strategic location in Central Europe, the Czech Republic has a high international enterprise cluster potential. Firstly, strong cross-border networks already exist at an informal level linking the Czech Republic with the economies of Poland, Slovakia, Germany and Austria, mainly concerning cross-border trade. As an illustration of the thriving commercial links in the "grey economy", it is sufficient to visit any market in the border areas between for example the Czech Republic and Poland. After admission of the Czech Republic, Slovakia and Poland to the EU in May 2004 and once some special clauses concerning for example the free movement of labour have expired, current informal relations will become legal. Secondly, formal cross-border co-operation is greatly encouraged. For example, Euroregions fostering co-operation among border regions have been created, offering assistance to small and medium-sized enterprises with cross-border links.

It is conceivable that EU enlargment and legal harmonisation will lead to the emergence of cross-border central European SME clusters including Czech firms. International clustering is most likely in the north eastern part of the Czech Republic linking the cities of Ostrava (Czech Republic), Katowice (Poland) and Zilina (Slovakia); in the south eastern part of the Czech Republic linking Brno (Czech Republic), Vienna (Austria), Budapest (Hungary) and Bratislava (Slovakia); in the south western part of the Czech Republic bordering on Austria and Germany; and in the north western part of the Czech Republic bordering on Poland and Germany.

In addition to organically growing cross-border clusters involving SMEs, EU membership is likely to accelerate the cluster phenomenon,

driven by large multinational firms such as the car industry, producing components in several new member countries.

Special attention needs to be paid to the north eastern part of the Czech Republic (the Moravia-Silesian region). This could emerge as the most dynamic Czech region with regard to the creation of transnational clusters given its convenient location bordering on Poland and Slovakia in the transport and geographic centre of gravity of the central European space, linking western and eastern as well as southern and northern Europe. The region has enormous potential for a transportation cluster of international significance. The 'magic' triangle formed by the three Czech towns towns of Bohumin, Jablunkov and Pribor holds the potential for a transport cluster combining automobile, railway, air and water transport. This cluster could jump-start development of other clusters linked to industry, trade and services not only in the Czech Republic, but also in the surrounding regions of southern Poland (around Katowice and Opole) and western Slovakia (around Zilina). Although this region currently appears to be very problematic, its development is expected to transform the whole region over the coming decade.

Areas for improvement

We recommend continuing the current approach of considering cluster formation in the Czech Republic as a bottom-up phenomenon that government cannot orchestrate but is able to support by building on existing programmes in the field of SME support and regional development. The regional nature of clustering needs to be taken more into account through these programmes.

In this respect, it is vital to review and reformulate the content of the KOOPERACE programme supporting SME associations in order to reinforce the sectoral and regional nature of the associations supported. A second useful measure would be to foster active labour market measures inspired by EU Territorial Employment Pacts to encourage cluster building with SME involvement. Another option would be to encourage the formation of genuine regional clusters based on technology and industrial parks. When considering the creation of large industrial zones and the attraction of foreign direct investment to specific regions and sectors, the interests of small and medium-sized firms need to be taken into account to mediate negative impacts due to power asymmetries. An important measure would be to encourage economic competition so as to prevent the creation of monopolies, for example in the automobile industry, breweries and energy supply to name just a few. Also with respect to the regional nature of

clustering, cross-border co-operation needs to be encouraged by supporting the activities of regional associations of municipalities and entrepreneurs.

Special cluster agencies or working teams at regional level could fulfil a co-ordinating role ensuring service delivery to clusters, supervising the creation of entrepreneurial parks and industrial zones, attracting and embedding inward investment to the region, strengthening firms inside clusters, fostering human resource development in existing and emerging clusters and building and sustaining cross-border co-operation with neighbouring regions.

Also important are concrete steps to foster co-ordination among key governmental actors in cluster building, such as the Ministry for Regional Development, the Ministry of Industry and Trade and key institutions such as the investment promotion agency Czechinvest. It would also be advisable to foster ongoing exchange of information with organisations such as the EU, OECD and UNIDO to increase awareness of international cluster experiences and best practices.

In an effort to strengthen cluster analysis and evaluation, the Czech Central Statistical Office should closely monitor cluster development and review cluster evidence on a regular basis. Each network and cluster receiving financial or non-financial support from the public sector should comply with its statistical reporting duty.

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Endnotes

[11] Zdenek Mikolas is especially grateful to Josef Kasic at the University of Ostrava for helping with translation and the making of the cluster graphs.

[12] Full description of Czech NACE sectors: A (01) Agriculture. C (10-14) Mining and quarrying. DA (15-16) Manufacture of food products, beverages and tobacco. DB (17-18) Manufacture of textiles and textile products. DC (19) Manufacture of leather and leather products. DD (20) Manufacture of wood and wood products. DE (21-22) Manufacture of pulp, paper and paper products, publishing and printing. DF (23) Manufacture of coke and refined petroleum products. DG (24) Manufacture of chemicals, chemical products and man-made fibres. DH (25) Manufacture of rubber and plastic products. DI (26) Manufacture of non-metallic mineral products (glass, china and ceramics). DJ (27-28) Manufacture of basic metals and fabricated metal products. DK (29) Manufacture of machinery and equipment. DL (30-33) Manufacture of electrical and optical equipment. DM (34-35) Manufacture of transport equipment. DN (36-37) Manufacture of furniture and secondary treatment. E (40-41) Electricity, gas and water supply. F (45) Construction. G (51-52) Wholesale and retail trade. H (55) Hotels and restaurants. I (60-63) Transport storage and communication. N (85) Health and social work.

Part III

Conclusions and Recommendations

Conclusions and Policy Recommendations

by Johanna Möhring

Conclusions

The catchwords to describe the phenomenon of firm agglomeration and its associated benefits, be it local productive systems, industrial districts, regional or enterprise clusters, have only recently entered policy dialogue in Central and Eastern European countries. However, clusters have caught the imagination of both policy makers and entrepreneurs alike as instruments to promote higher productivity and competitiveness, boost innovation, strengthen SMEs and favour a more equal regional economic development. Increasingly, clusters are used as components of policy focused on achieving many economic and social goals. Policy makers, economic development practitioners and entrepreneurs from Central and Eastern Europe are looking for ways to share their individual experiences with countries around the world and exchange views on similarities and differences with the aim of identifying good cluster policy practice.

This book aims to further this exercise of information exchange and policy development. It presents first cluster mapping evidence from Slovenia, Slovakia, Hungary, Poland and the Czech Republic. It also provides an audit of policies currently in operation that directly or indirectly foster local and regional clustering, such as programmes to bring together a critical cluster mass, to encourage inter-firm networking among SMEs, to attract and embed foreign direct investment and to prevent regional economic disparities. The issue of social capital, identified as crucial to allow companies to simultaneously co-operate and compete, is also given attention. Using a common methodology to identify clusters combining quantitative with qualitative data, a first snap shot of the cluster phenomenon in central Europe has emerged.

The picture emerging from the research points to clustering firms and cluster structures in all five countries studied in a variety of sectors ranging from traditional to high-tech industries. The cluster phenomenon seems to be very much driven by the forces of globalisation triggering multi-faceted reactions in national economies at local and regional level. In most countries covered by this book, clustering is strongly FDI-driven, with local firms clustering around one or several strategic foreign investors, especially in the automotive sector. Spontaneous bottom-up movements link private sector actors in an effort to stave off competition from multi-nationals such as super-markets that are expanding operations into the countries of central

Europe. These inter-firm networks can take the shape of co-operatives. Other bottom-up responses to increasingly internationalised economies include efforts to bring together SMEs in an attempt to improve their negotiating position as suppliers to international value-chains. But not all clustering is due to FDI. In all countries, remnants of pre-communist industrial districts remain – in some cases, they have retained a competitive advantage and hesitantly come alive again now. Increasingly, local and regional clusters reach beyond national boundaries, be it looking for trading opportunities across borders or linking up with cluster counterparts across the world in an attempt to share experiences and gain knowledge.

In Slovakia, Hungary and the Czech Republic, cluster formation seems to be mainly driven by large multinationals around which SMEs are clustering as part of international value chains. At the same time, home-grown SME clusters, often in traditional sectors, are slowly emerging. Slovenia, having attracted only a small portion of eastern-bound FDI flows, turned to the cluster strategy to move up global value chains to higher added-value products. In Poland, clustering was found in high and low-tech sectors involving both SMEs and big firms while being simultaneously FDI-driven and home-grown.

Of the five countries covered in this book, two, Slovenia and Hungary, have adopted an official policy of cluster support to harvest associated economic benefits. Slovakia, Poland and the Czech Republic have created an incentive structure to encourage inter-firm networking and co-operation, favouring a more hands-off approach.

Slovenia

So far, the Slovenian approach has fostered eleven institutionalised clusters in fields such as for example the automotive sector, machine tools and logistics encompassing 700 companies working on more than 150 joint projects in areas such as marketing, production, R&D and internationalisation. The key result of Slovenian cluster policy is the build-up of a critical mass of information, knowledge, skills and technologies allowing groups of companies to confront a lack of resources in the commercial sector, an insufficient awareness of business opportunities and an inability to apply progressive organisational systems and new technologies in business processes. A by-product of this policy is the realisation that social capital based on the common values of understanding and trust between companies and between companies and the state is the key to the acceleration of the cluster process itself.

Slovenia became interested in clusters towards the end of the 1990s while grappling with a significant lag in competitiveness of Slovenian

industry compared with the EU average. Thus, it was decided to integrate the cluster concept as a strategic part of a pro-active industrial policy with the long-term goal of bridging the identified competitiveness gap by creating unique local products, technology and now-how that would be difficult to copy. In an initial period, cluster development was primarily oriented towards strengthening co-operation among companies, institutions and support organisations. This strategy is complemented with a programme specifically targeting local clusters and promoting SMEs.

Despite these successes, the readiness of leading Slovenian companies to take over the role as core of a concentric circle of suppliers remains relatively low. The conflicts of interest that arise promote a vicious circle of insufficient engagement on the part of the senior management in the development of the cluster itself and an inability to bring about specific commercial projects that would be generated and realised thanks to the cluster.

Slovenia decided on an approach combining bottom-up with top-down elements encouraging clustering of SMEs around a lead company, mostly large in size, in an approach of "dynamic concentric circles". Instead of a single measure to encourage cluster development, linkage, co-operation, networking and cluster development among firms and support institutions is encouraged in Slovenia. The efforts includes a range of horizontal measures and instruments whose basic objective is to strengthen the abilities of companies, institutions and organisations to work together in regional, national and international network structures.

Slovakia

Clusters can be found in traditional industries, such as textiles, leather, wood and furniture production, printing and publishing, as well as in more high-tech sectors such as electrical and mechanical engineering. Economic activities mainly concentrate around a few growth poles such as in western Slovakia around Bratislava (the region has a potential for cross-border co-operation with neighbouring Austria) or in eastern Slovakia around Kosice/Presov. Four manufacturing case studies, two in high-technology (auto assembly/components and electronics) and two in low-technology industries (chemicals and clothing), outline the determining role of foreign direct investments creating global production networks in which numerous domestic SMEs participate.

Even though entrepreneurship and SME development is supported by many policy measures strengthening SMEs and promoting FDI attraction, there is no official cluster policy in the Slovak Republic.

Like its central European neighbours, Slovakia suffers from unequal regional development with economic growth concentrating in a few regions, yet policy makers and regional authorities seem unable to jump start endogenous economic growth. The influx of FDI and emerging cluster structures reveal the vulnerability of an economy based on activities at the lower end of the value-chain.

A key insight from the Slovakian chapter is the necessity to integrate policy areas such as FDI promotion, labour market policies and policies promoting science and technology among others into tailor-made regional development approaches fitting individual competitiveness profiles. In this respect, clusters constitute an ideal policy planning tool.

Poland

Polish emerging clusters have a strong regional element, with spontaneous bottom-up networking in evidence since economic transformation. The Gdansk Institute for Market Economics cluster mapping project found a number of significant industry concentrations, all but two situated in the more developed regions of Poland. In central Poland – Mazowieckie (capital Warsaw), Wielkopolskie (main city Poznan) and Łódzkie (main city Lodz). In southern Poland – Dolnośląskie (main city Wroclaw), Małopolskie (main city Crakow) and Śląskie (main city Katowice). In northern Poland – Pomorskie (main city Trojmiasto, bordering on the Baltic Sea). Two concentrations are situated in a structurally weak region – Warmińsko-Mazurski in north-eastern Poland at the Baltic Sea. Most of the clusters are situated in Wielkopolskie and Mazowieckie, Poland's most developed regions. Empirical studies found clustering in high-tech branches such as control engineering, biotechnology, computing, electronics and telecommunication with firms grouping around universities and research institutes tapping into a well-developed R&D infrastructure. While vertical relations proved to be weak, foreign influence in terms of inputs (technology, information) played a strong role. Traditional clusters, such as in the fields of printing, construction and agriculture showed strong vertical relations and evidence of regional networking, but weak links with local authorities and banks.

The concept of clusters as a policy tool is a new in Poland, with growing interest in networking observable specifically in terms of innovation policy. Cluster mapping and regional studies presented show that there is strong potential for the development of competitive cluster structures in Poland. In addition, the analysis of relations in the cluster mapping project confirmed the benefits of interactive, cluster behaviour. However, an overview of policy and institutions supporting small and medium-sized enterprises

revealed that so far, no specific measures to foster clusters have been undertaken.

Despite advances in high-technology, Poland is still dominated by traditional sectors responsible for the majority of exporters that risk coming under competitive pressure from low-wage countries. In both high-tech and traditional branches, obstacles to cluster building are a lack of interest in co-operating, lack of financial resources and lacking regional policy supporting such endeavours.

Throughout Poland, regional innovation strategies are being carried out: Emerging clusters building on networks around universities play an important role in regional development.

Hungary

In 2003, there were 22 recognised clusters in both traditional and high-tech industries located in almost all of Hungary's regions. However, only ten out of twenty-two officially recognised clusters showed up on the criteria used for the cluster mapping research used for this publication, which focuses more on sizeable concentrations in administrative units. More importantly, the cluster mapping research showed the presence of potential clusters that are not currently supported, such as the textile clusters in Western Transdanubia, Southern Transdanubia and the Northern Great Plain Regions, potential food-industrial clusters in the Southern and Northern Great Plain Regions and in fashion and software development.

Since the end of the 1990s, Hungary has engaged in a policy of active cluster support. The regional development programme of the Széchenyi Plan includes a programme to provide financial support from the government for the development of Hungarian clusters. Perhaps not surprisingly, the first officially recognised clusters started to work in the economically more developed regions in the north-west, where there is a strong correlation between regional economic activity, enterprise density and locations of official clusters (Western Transdanubia, Central Transdanubia and Central Hungary).

Hungary has successfully mastered economic transition, benefiting from its geographic location and attracting the lion's share of foreign direct investment in Central and Eastern Europe. As large multinational firms play a very significant role in the Hungarian economy, it is not surprising that foreign firms should often form the core of emerging, mostly vertically-integrated clusters, with the automotive industry as an example. Cluster-building in Hungary has been largely foreign investment-driven, with home-grown clusters slowly emerging. This trend has been to the detriment of sustainable regional development, as growth-generating economic activities

have concentrated in the western parts of the country leading to a factual economic east-west divide that is growing ever wider.

Coupled with policies to strengthen SMEs and to embed foreign direct investment, Hungary's cluster approach could help to promote sustainable regional development in the future. A successful example of this strategy is the Pannon Economic Initiative (PGK) in Western Transdanubia founded in 2001 as a public-private partnership using a cluster organisation as core for a need-driven, participatory evolving regional development concept.

Czech Republic

The Czech country cluster study identified clustering firms in various sectors for production industries in all fourteen regions of the Czech Republic. Three types of enterprise clusters and networks were identified. First, the "brownfield" cluster, building on Czech industry tradition often with the help of foreign direct investment, second the "greenfield" cluster, new industry agglomerations (such as in metallurgy and engineering, like in Moravia), be it foreign- or domestic-driven (such as national supplier networks for large international firms such as Volkswagen/ Skoda) and lastly, the "bottom-up" cluster, led by SMEs to negotiate competitive pressures (such as co-perative type SME networks). There seems to be strong potential for cross-border co-operation with the potential emergence of a supranational automotive multicluster in central Europe with its core in the northeastern part of the Czech Republic within reach of Poland, Slovakia and Hungary.

The cluster concept is still relatively new in the Czech Republic. However, the Czech Ministry of Industry and Trade has recognised inter-firm networking as an important tool to strengthen SMEs in the face of an increasingly global competition. In addition to financial support for enterprise co-operation (the KOOPERACE programme), many governmental programmes exist that target regional development in general. The Society of Technology Parks, the counselling agency Czech Venture Partners and the Czech Innovation Centre among others provide general support for enterprises. The Czech Agency for Foreign Investments (Czechinvest) stands out as an important actor in FDI-driven cluster development, co-ordinating the foundation of industrial zones and searching for strategic investors.

As in the other case study countries, Czech industry needs to build up competitiveness to move beyond cheap labour as the main attraction point for foreign direct investment. FDI needs to be used in such a way as to contribute not only to the upgrading of infrastructure, but also to the upskilling of the labour force.

Local economic context constituted by specific traditions and associated skills can survive the onslaught of political and economic upheavals to constitute a unique resource

Recommendations

The policy recommendations presented below derive from a wide body of academic research and a wealth of practical cluster experience compiled over a period of more than two decades. General as well as specific insights into cluster strategy, programme design and cluster management have been validated by cluster experiences from the five case study countries Slovenia, Slovakia, Poland, Hungary and the Czech Republic.

Whereas most recommendations outlined below can inform policy in traditional OECD countries that often grapple with similar policy challenges, special emphasis is paid to the post-communist context. Given shared experiences from socialist times it is highly likely that recommendations detailed below can inform policies in other countries from Central, East and South East Europe. Recommendations concern three thematic areas: Cluster strategy (promoting goals ranging from fostering competitiveness and innovation, or strengthening SMEs and local industry, to regional development); programme design (detailing components for a working institutional framework to underpin clusters) and cluster management (providing advice for day-to-day cluster management).

Cluster strategy: What can clusters achieve?

Clusters can be used in many ways to pursue a variety of economic policy goals. In the context of the case studies, five policy goals were primarily identified where a cluster approach could prove to be useful: (i) The upgrading of competitiveness of national industry, (ii) local and regional development, (iii) attraction and embedding of FDI, (iv) the fostering of innovation, and (v) SME support.

Clusters and competitiveness. As identified in the case studies (the prime example being Slovenia), upgrading the competitiveness of local industry is seen as key to laying the foundations for long-term national growth and prosperity in a globalised world. Cluster mapping should be used as a tool to identify those sectors of industry that have a local competitive advantage or the potential to develop it. Clustering can promote competitiveness, driving local processes of innovation and leading to the development of unique local competitive advantage.

Clusters and local and regional development. A host of measures exists to encourage local and regional development, ranging from the provision of

infrastructure, encouraging entrepreneurship via business incubators, special economic zones and access to finance, to special measures for training the local and regional labour force, to name just a few. Countries such as Slovakia, Poland and the Czech Republic deploy a wide variety of policy measures cited above, but often with limited success. Clusters can be very useful when developing integrated local and regional development concepts based on local partnerships that identify local and regional needs and potential.

Clusters and attraction and embedding of FDI. In all countries but Slovenia, cluster formation and the internationalisation of SMEs is driven by FDI. However, an FDI influx cannot be taken for granted. It is therefore recommended to integrate the cluster concept in national strategies for attracting and embedding foreign direct investment. By identifying and building on existing cluster competencies and supplier networks, investors will be provided with a medium to long-term perspective for the achievement of competitiveness. To embed foreign direct investment, attraction policies need to be complemented with measures to upgrade the skills of the local workforce in order to meet current and future investor requirements.

Clusters and innovation. Upgrading the knowledge-base of national industries or attempting to foster product and process innovation is a costly enterprise. Due to their capacity to promote innovation, cluster strategies should be contemplated when designing policies promoting science and technology, such as in the case of regional development policies in Poland.

Clusters and SMEs. Clusters are tools to help SMEs to be successful under conditions of global competition. In turn, cluster development can be encouraged by an active SMEs support policy, such as supporting SME associations emphasising sectoral and regional aspects of entrepreneurial activities.

Cluster programme design – What is the right policy and matching institutional framework?

Once the primary goals to be achieved by a cluster-based strategy are identified, the right programme design needs to be established taking into account the complexities of often inter-related policy areas.

Market failure. A hands-off approach strictly limiting state intervention to market failure should be favoured with financial support conditional to clear criteria based upon bottom-up entrepreneur-led initiatives with a proven potential for self-sustainability.

Sustainability. The general goal of a cluster strategy should be sustainability. Cluster policies, or local and regional development policies in general need to be designed with a long time horizon in mind.

Policy mix. Clustering is promoted by many inter-related policy areas, such as entrepreneurship and SME support, FDI promotion, education and training policies, regional development, provision of infrastructure and logistics, research and development and competition policy. Special emphasis should be put on measures to strengthen social capital, especially in the context of post-communist countries.

Adaptation. The adaptation of policy to the specific needs of individual clusters requires greater involvement from the state. However, this does not necessarily entail an increase in direct financial resources for individual clusters, but primarily a more active participation of all ministries in cluster development and the promotion of public-private partnerships.

Cluster-specific business support services. Most business support measures can be used to promote clusters, such as the promotion of start-ups and business networks, provision of risk capital, assistance for pooling of resources for common projects such as the joint use of ICT, issuing of certificates, joint testing, promotion of a common design and logistical support. Other elements of crucial importance are support in the search for suitable personnel and activities to encourage the internationalisation of companies in a cluster.

Institutional framework at local, regional and national level. Local cluster offices could assist the development of local networks of micro and small businesses. Their role would be to accelerate networking among companies at the local level, to assist in identifying and realising joint opportunities for groups of companies, and to co-ordinate the functioning of individual local networks. Special cluster agencies or working teams at local and regional level could fulfil a co-ordinating role ensuring service delivery to clusters, supervising the creation of entrepreneurial parks and industrial zones, attracting and embedding inward investments to the region, strengthening firms inside clusters, fostering human resource development in existing and emerging clusters, and building and sustaining cross-border co-operation with neighbouring regions.

At national level, inter-ministerial groups, taking into account the multiple facets of clusters, should be constituted, taking a supervisory role assessing policy and cluster performance. Both bottom-up and top-down channels of communication should link clusters, their support infrastructure and policy makers. For the evaluation of cluster programmes, a commission consisting of independent national and foreign experts, representatives of

respective ministries, as well as representatives of companies involved in clusters could be constituted.

Evaluation and exchange. Programmes defining the precise conditions for support should be preferred. Effectiveness of implementing cluster policy at the operational level could be increased by evaluating cluster developments each year taking into account the element of social capital. In an effort to strengthen cluster analysis and evaluation, National Statistical Offices should closely monitor cluster development and review cluster evidence on a regular basis. Each network and cluster receiving financial or non-financial support from the government or a region should comply with its statistical reporting duty.

It is recommended to foster ongoing exchange of information with organisations such as the EU, OECD and UNIDO to be aware of international cluster experiences and best practice.

Cluster management

Cluster management involves the day-to-day promotion of clusters, both at the entrepreneurial and support structure level.

Raising awareness about the cluster concept. Institutional actors need to make entrepreneurs aware of the role of knowledge-based networking and of co-operation based on local resources to achieve competitiveness under conditions of increasing competition. In turn, improved networking on behalf of senior management can open doors to key customers and establish constructive dialogue with various ministries, the chamber of commerce and industry as well as with development institutions.

Investing in professional leadership. Clusters benefit from specifically trained cluster managers with industry knowledge and a grasp of the intricacies of cluster co-operation. Cluster managers need to be skilled facilitators and possess talent for leadership. Sometimes, it might be necessary to bring in outside mediators to identify conflicts and to negotiate solutions with all cluster stakeholders. Cluster managers/mediators could be instrumental in implementing measures to strengthen social capital.

Promoting joint projects. To strengthen cluster cohesion and growth, joint projects in financing, marketing and communication, ICT, establishment of sales channels, development of technologies, internationalisation, strengthening of assets and resources should be encouraged.

Fostering of cluster competencies. To cultivate unique local competitive advantage, substance-oriented networking among cluster participants should be encouraged. For example, networking among research

and development personnel could accelerate innovation via the development of new technologies and products. Targeted training and education measures can also contribute to the upskilling of workers inside a cluster and to the gradual transformation of the competitiveness of an industry as a whole.

Strengthening of social capital. Cluster managers and facilitators should devote resources to social capital building. In addition, potential negative features of social capital in clusters, such as the exclusion of specific socio-economic groups, insularity or stagnation should be prevented by supporting co-operation and mobility.

Promoting exchange and openness. Clusters crucially depend on the free flow of information and human resources, be it inside a cluster or in communication with the outside world. Membership of firms in cluster associations should not be limited or competition could be stifled. Cluster managers, as well as key personnel of cluster enterprises, can benefit from exhange of information and experience with their counterparts nationally and internationally.

ANNEX A

List of Abbreviations

BICs Business and Innovation Centres

CZK Czech Koruna

CBC Cross Border Clusters

CADSES Central Adriatic Danube South Eastern European Space

CEE Central and Eastern Europe

CEI Central European Initiative

CMEA (Comecon)

DG Direction Générale (EU Commission Directorate General)

EBRD European Bank for Reconstruction and Development

FDI Foreign Direct Investment

EC European Commission

EU European Union

EUR Euro

EBRD European Bank for Reconstruction and Development

GIME Gdansk Institute for Market Economics

HUF Hungarian Forint

ICT Information and Communication Technology

IMF Internartional Monetary Fund

Interreg IIIB Interregional Programme Atlantic Area

KIBS Knowledge-Intensive Business Services

LAD Local Administrative Districts (Poland)

LPS Local Productive Systems

LEED Local Economic and Employment Development Programme

METESZ Federation of Technical and Scientific Societies

MoET The Hungarian Ministry of Economy and Transport

CSO (GUS, main statistical office, Poland)

NATO North Atlantic Treaty Organisation

NACE Nomenclature statistique des Activités économiques dans la Communauté Européenne

NADSME National Slovak

NUTS Nomenclature of Territorial Units for Statistics

NBP National Bank of Poland

OMAR Institute of Macroeconomic Analysis and Development (Slovenia)

PAIZ Polish Agency for Foreign Investment

PAED Polish Agency for the Development of Entrepreneurship

PHARE Poland and Hungary: Aid for Restructuring of the Economies

UNIDO United Nations Industrial Development Organisation

PKD Consulting and Advisory Point (Poland)

PRS Training Refund Centre (Poland)

RFI Regional Financial Institutions

RPIC Regional Advisory and Information Centres

RDP Regional Development Programme

ROP Regional Operational Programme

SKK Slovak Koruna

SZRB Slovak Guarantee and Development Bank

SARIO Slovakia's one-stop shop investment promotion agency

SARC Centre for Advancement, Science and Technology Slovakia

SEZ Special Economic Zones

SMEs Small and medium-sized enterprises

SOOIPP Polish Business and Innovation Centres Association

TNCs Transnational Corporations

UNECE United Nations Economic Commission of Europe

USD US Dollar

ANNEX B

The OECD Local Economic and Employment Development (LEED) Programme

The LEED approach

The Local Economic and Employment Development (LEED) Programme of the OECD is dedicated to the identification, analysis and dissemination of best practices and innovations in local economic and employment development policy. The Programme draws not only on the experience of its members, which include OECD member and non member governments and international organisations, but also on a great number of public, private, non-profit and sub-national organisations gathered in its Partners' Club.

The Programme's activities are structured around the following axes:

- Decentralisation of employment policies, local partnerships and governance.
- Entrepreneurship, self-employment and job creation.
- Social cohesion at the local level.
- Globalisation and local authorities.
- Evaluation of local economic development policies.
- Outreach with non-member economies.

LEED events

LEED organises a wide range of conferences and seminars for the exchange of experience on the above themes. They are often organised in collaboration with partner governments and development agencies.

LEED reviews

LEED also contributes to the dissemination of information on local development policy innovations and good practices through several cross-country review studies.

In the field of entrepreneurship, national, city and regional governments and development agencies from OECD member and non-member countries can contact the OECD Secretariat to express their interest in participating in the following reviews:

OECD Local Entrepreneurship Reviews

The Local Entrepreneurship Reviews evaluate the opportunities and obstacles to entrepreneurship activity in participating case study cities and regions in order to provide local policy makers with policy recommendations and learning model examples that will assist in generating greater new firm creation and small business activity in their area. Each review results in a report to the participating area on the strengths and weaknesses of its local entrepreneurship environment and recommendations for policy development and implementation arrangements made in the light of international good practices.

OECD Reviews of Foreign Direct Investment and Local Development

The Foreign Direct Investment Reviews provide information on how to develop effective and efficient foreign direct investment policies and programmes in the cities and regions that participate as case studies. The focus is on developing the best approaches to the attraction, retention and embedding of foreign direct investment. Recommendations are made to each participating city and region based on a comparison of existing practice with good practices internationally. A series of learning model initiatives are also described with potential for adoption in each case study area.

OECD Reviews on Local Innovation Systems

The Local Innovation Systems Reviews set out the issues and identify international best practices in strengthening local innovation systems. These systems involve networks and linkages among firms, government agencies and research and training organisations that lead to knowledge transfer and increased innovation and entrepreneurship activity in those activities in which localities can achieve sustainable comparative advantage. Recommendations will be made in case study areas on opportunities for policies to strengthen the assets, connectivities and capabilities of a local innovation system.

Women's Entrepreneurship Reviews

The Women's Entrepreneurship Reviews examine the role of female entrepreneurship in the dynamics of local development and to give an overall review of the current situation of women entrepreneurs in a given territory. The studies result in the elaboration of recommendations for policy makers to help them to implement tools adapted to the real needs of women entrepreneurs in their localities.

LEED publications

The outcomes and results of LEED activities are published on a regular basis in the OECD Local Economic and Employment Development Series. Recent titles include:

- Entrepreneurship: A Catalyst for Urban Regeneration.
- Global Knowledge Flows and Economic Development.
- Private Finance and Economic Development. City and Regional Investment.
- Entrepreneurship and Local Economic Development.
- Devolution and Globalisation. Implications for Local Decision Makers.

The LEED Partners' Club

With a membership of over 100 partner institutions, the Partners Club is LEED's worldwide network of regional and local governments, development agencies, non-profit organisations and foundations. Four consultative groups have been created to channel the interests of the different members:

- Forum of Cities and Regions.
- Forum on Social Innovations.
- Forum on Entrepreneurship.
- Forum on Partnerships and Local Governance.

OECD LEED Trento Centre for Local Development

The OECD LEED Trento Centre for Local Development in Italy was established in 2003 in order to build capacities in local development in OECD member and non-member countries in Central, East and South East Europe.

The main objectives of the Centre are:

- To improve the dissemination capacity of best practices in the design and implementation of local development strategies and facilitate the transfer of expertise and exchange of experiences between OECD member and non-member countries.
- To strengthen the relationship between policy makers, local development practitioners and the scientific community.
- To reinforce participative and representative democracy at sub-national level by initiating and supporting a dialogue between national and sub-national legislatures on local development issues.

The main focus areas of the Trento Centre are policies to promote entrepreneurship and the non-profit sector, developing strong local governance mechanisms and promoting a culture of policy evaluation.

In the field of entrepreneurship the Centre organises a series of conferences in Central, East and South East Europe on themes such as SME finance, clusters, SME internationalisation, SME innovation, advice and training services to SMEs and entrepreneurship education. It also organises one-week capacity building seminars for entrepreneurship policy makers from countries in the Central, East and South East Europe region.

Further information

For further information on the LEED Programme and its events, reviews, publications and Partners Club visit www.oecd.org/cfe/leed.

For further information on the OECD LEED Trento Centre for Local Development and its activities in Central, East and South East Europe visit www.Trento.oecd.org.

LEED publications can be ordered from www.oecd.org/bookshop.

ANNEX C

The Central European Initiative

CEI's objectives and history

The **Central European Initiative** (**CEI**) is composed of 17 Member States: Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Hungary, Italy, Macedonia, Moldova, Poland, Romania, Serbia and Montenegro, Slovakia, Slovenia and Ukraine.

The main aim of the Initiative is to help transition countries in Central and Eastern Europe in approaching the European Union (EU). Although the CEI is not a major donor organisation, it disposes of several funds which are used to promote projects in diverse sectors of activity. The accession of five CEI Member States to the EU in May 2004 has shifted CEI's focus towards the 10 Member States remaining outside the EU.

Among all the regional groupings in Central and Eastern Europe the CEI has the longest history and covers the largest area.

The origins of the CEI lie in the agreement signed in Budapest in November 1989 by Italy, Austria, Hungary and former Yugoslavia, establishing a platform for mutual political, economic, scientific and cultural co-operation called *Quadrilateral Co-operation*. In May 1990 with the admission of Czechoslovakia, it became the *Pentagonal Initiative*, and in 1991, following the adhesion of Poland, the *Hexagonal Initiative*. In 1992, the grouping was renamed the *Central European Initiative* since the membership was extended to Bosnia & Herzegovina, Croatia and Slovenia – following the dissolution of former Yugoslavia – and a year later to Macedonia as well as to Czech and the Slovak Republic (after the dissolution of Czechoslovakia).

In 1993 the Secretariat for CEI Projects was created in London in order to manage the newly established CEI Trust Fund at the European Bank for Reconstruction and Development (EBRD). In the mid 1990s, Albania, Belarus, Bulgaria, Ukraine, Romania and Bulgaria joined the Initiative. In March 1996, the CEI Centre for Information and Documentation, two years later renamed CEI-Executive Secretariat (CEI-ES), became operative in Trieste.

In 1998 the first CEI Summit Economic Forum took place in Zagreb. In November 2000, the CEI membership increased to the current number when the Federal Republic of Yugoslavia (now Serbia and Montenegro) joined the CEI. The CEI Summit meeting in Trieste in 2001 launched the idea of establishing the CEI University Network and the first CEI Youth Forum was held. In 2002, the institutional reforms of the CEI strengthened the role both of the parliamentary and the business dimensions and the CEI Co-operation Fund was created. After the accession of five CEI Member States to the European Union in May 2004, the CEI developed a number of new instruments in order to increase its usefulness for the countries of Central and Eastern Europe striving for EU membership.

CEI's functioning and structure

The organisation operates through various structures: the annual Summit of the CEI Heads of Government, held in parallel to the CEI Summit Economic Forum (SEF), the annual Meeting of the Ministers of Foreign Affairs, Ministers of Economic Sectors and other ministerial or high level events such as the Meetings of the Political Directors, monthly meetings of the Committee of National Co-ordinators (CNC), meetings and other activities of CEI Working Groups covering various areas of economic, human and institutional development and co-financing of numerous other events (conferences, workshops, training courses etc).

The annual **CEI Summit**, gathering the Prime Ministers from the 17 CEI Member States, decides on the political and economic orientation for CEI co-operation and gives visibility to the organisation. Decisions on organisational matters are taken at the **MFA Meetings** whereas the **Committee of National Coordinators** is the key body responsible for the management of CEI co-operation as well as for the implementation of CEI programmes and projects. Currently, the CEI has **17 Working Groups**, composed of representatives/experts from all member countries. In order to increase their efficiency, several small Task Forces have been created which co-operate on specific issues.

The above-mentioned activities are supported by the **CEI Executive Secretariat (CEI-ES)** and the **Secretariat for CEI Projects (CEI-PS)**. The CEI-ES is based in Trieste. It operates with the legal status of an international organisation and is headed by a Director General, seconded by Austria, who is supported by two Deputy Directors, seconded by Italy and Slovenia. The Secretariat for CEI Projects has been operative at the European Bank for Reconstruction and Development in London since the beginning of the 1990s and maintains offices both in Trieste and London. The Secretariats provide new impulses for the CEI's work programme and guarantee the continuity of effort in its implementation. In particular, they

prepare the documentation needed for decisions taken by Prime and Foreign Ministers, the CNC and the Working Groups, collect, evaluate and follow-up projects co-financed through the CEI funds, and perform other tasks necessary for the functioning of the organisation. The Secretariat for CEI Projects is the main organiser of the annual Summit Economic Forum.

Financial support for the functioning of both Secretariats is provided by Italy. With the Law 142 adopted on 3 June 2003 the Italian contribution to the CEI-ES was considerably increased. This has permitted the CEI to step up its activities and the operational capacities of its Trieste headquarters which has been enlarged and modernised. The funds received from Italy on the basis of above-mentioned Law have also made available additional resources used for the Cooperation Fund, the CEI University Network, and the CEI Science and Technology Network. The CEI-PS activities and projects are financed by the CEI Trust Fund at the European Bank for Reconstruction and Development (EBRD), contributed by Italy.

The representatives of the **CEI Parliamentary Dimension** as one of three basic pillars of the organisation, along with the Governmental and the Business Dimension, are regular participants of all high-level CEI meetings, they are involved in working group activities and develop their own within (currently seven) ad hoc committees. The country holding the CEI Presidency also chairs the Parliamentary Dimension.

The Central European Chamber of Commerce Initiative (CECCI) represents the **CEI Business Dimension** and acts as a regional forum for co-operation and consultation among and between the Chambers of Commerce in all CEI Member States. The CECCI organises various events aimed at promoting business and entrepreneurship in the region. It works through the annual Presidents' Conference chaired by the President (the annual Chamber of Commerce Presidency is based on the rotating system of the CEI Presidency) and the Secretariat, exercised by Unioncamere (Italian Association of the Chambers of Commerce) based in Rome.

CEI funds, technical co-operation and co-operation activities

The **CEI Trust Fund at the European Bank for Reconstruction and Development** represents the most important source of financing for the CEI activities in the area of infrastructure (roads, railway, air navigation, municipal and environmental projects etc.), energy, and SMEs. Since the establishment of the institutional and technical co-operation link with the European Bank for Reconstruction and Development (EBRD) in 1991, the CEI has utilised over EUR 17 million for technical assistance and co-financing projects and over EUR 7 million in development programmes, seminars and international events. EBRD's investments supported by the

CEI amount to over EUR 330 million, generating further investments for a total project value of over EUR 1.7 billion.

In 2002, the **CEI Co-operation Fund**, consisting of contributions from all Member States, became operational. Since then, nearly 150 **co-operation activities** (seminars, workshops, training courses, conferences etc.) amounting to more than 1.2 million Euro were co-financed through this Fund in various fields and in various member countries. Although projects in the field of culture still prevail, in the recent period an increased number of co-operation activities have emerged in other areas as well, such as education, SMEs, agriculture and science and technology.

In line with the Rules of Allocation, the CEI co-finances a maximum of one-half of project costs. Preference is given to the Member States who have the greatest need for accelerated development. Moreover, projects have to be compatible with the CEI Plan of Action.

In order to facilitate the participation in CEI events of representatives and experts from CEI Member States with lower incomes, the CEI disposes of the **Solidarity Fund** based on voluntary contributions from member countries. Since its establishment in 1998, the Fund enabled more than 100 representatives and experts to take part in various seminars, workshops, training courses or other kinds of events organised or sponsored by the CEI.

The **CEI Funding Unit** was created in January 2004, with a view to attracting EU and other outside funding for CEI projects and to promote the participation of CEI countries in trans-national projects at European level. Since the new EU external border cuts across the CEI region, the CEI partnership in EU projects aims at promoting links between stakeholders from old and new EU countries and the countries of the so-called New Neighbourhood Policy of the EU.

The **CEI Evaluation Unit**, operative within the CEI-ES since January 2005, supervises the pre- and post-implementation phases of the Co-operation Activities co-financed by the CEI.

Working areas: From agriculture to youth affairs

The CEI develops activities in the following areas focusing on the priority tasks indicated below:

- **Agriculture**: Micro-financing for small farmers, support to wholesale markets.

- **Civil Protection**: Cross-border co-operation as a prevention against and in cases of natural disasters.

- **Combating Organised Crime**: Illegal trafficking of human beings, stolen vehicles, financial frauds.

- **Cross-border Cooperation**: Promotion of best practices in this field.

- **Culture**: Sponsorship of various cultural projects, preservation of cultural heritage.

- **Education**: Development of the CEI University Network.

- **Energy**: Use of biomass.

- **Environmental Protection**: Work towards environmentally sustainable development of the CEI region with regard to transport, noise pollution and spatial planning.

- **Human Development and Training**: Life-long learning, adult education.

- **Information and Media**: Cross-border television, work towards improved media legislation in the CEI region.

- **Migration**: Training courses for migration officers, work towards flexible visa regimes.

- **Minorities**: Regular reviews of minority protection in Member States on the basis of the CEI Instrument.

- **Science and Technology**: Development of the CEI Science and Technology Network.

- **Small and Medium Enterprises:** Support for SMEs through various advisory programmes (BAS, TAM).

- **Tourism**: Work towards improving the quality of tourist management in the CEI region.

- **Transport**: Technical assistance to Member States as regards roads, air navigation and port development.

- **Youth Affairs**: Organisation of the annual CEI Youth Forum.

A total of 17 **CEI Working Groups** are active in the above-mentioned areas. Each Working Group is composed of the representatives (experts from various ministries and other governmental as well as non-governmental institutions) from all Member States and is chaired by either one or two chairpersons. Working Groups usually meet once or twice a year. Increasingly, Working Group meetings are being scheduled back to back with special workshops or seminars. Between meetings, Working Group members evaluate projects proposed for CEI co-financing. At the CEI-ES a Focal Point is entrusted with the liaison to each of the Working Groups, preparing their meetings and following them up with regard to the implementation of decisions adopted.

In addition, the CEI-ES offers the logistic and administrative support to the **Corridor V Secretariat** which became operative on the premises of the CEI Executive Secretariat in Trieste in October 2004 with the task of accelerating the development of the Corridor connecting northern Italy with Central and Eastern Europe.

Specific CEI programmes: Networks and know-how transfer

The **CEI University Network** became operative in 2003. It aims at facilitating co-operation among the universities and other institutions of higher learning in Central, Eastern and South Eastern Europe through various types of training programmes. It is based on the principle of mobility of both students and teaching staff and functions by offering grants and awarding scholarships for specific Joint Programmes. The Network is headed by the Rector of the University of Trieste in the capacity of Secretary General. Its Secretariat is based at the CEI-ES Headquarters in Trieste. It provides the financing and assists in the implementation of Joint Programmes proposed by at least two Participating Universities belonging to different CEI Member States.

The **CEI Science and Technology Network** was launched at the beginning of 2004. It operates through several lead scientific institutions in Trieste and partner institutions in other Central, South-Eastern and Eastern European countries, offering young scientists from CEI countries, particularly those outside the EU, the opportunity to participate in PhD courses, in training programmes and research activities in various fields of natural sciences and mathematics. In 2004, the project *"From Research to Enterprise"* awarded financial support to scientists and researchers from CEI countries to enable them to commercialise their research results. The CEI grants are meant to be used as seed money for financing feasibility studies for their business ideas.

The **CEI Know-how Exchange Programme (KEP)** is a financial instrument that became operational in 2004 in view of the EU enlargement. It provides support to the transfer and dissemination of know-how in economic transition and institution building to non-EU members within the CEI. To this end, the CEI is fostering the transfer of the specific transformation experience gained by the new EU members (the Czech Republic, Hungary, Poland, the Slovak Republic and Slovenia) over the past decade. The programme is financed from a special window in the CEI Trust Fund at the European Bank for Reconstruction and Development. Information on partners and programmes eligible for KEP support can be found on www.ceinet.org/KEP.

CEI Summit Economic Forum: A unique business event

The first **CEI Summit Economic Forum (SEF)** was organised in 1998 in Zagreb, on the occasion of the Summit of the Heads of Government. Since then it has developed into the main annual CEI business event taking place each November simultaneously with the Prime Ministers' Summit in the country holding the CEI Presidency.

The Forum, organised each year in partnership between the CEI Secretariat for Projects and the host country, gathers government officials, industry leaders, business people, entrepreneurs, investors, financial institutions, international organisations, investment and trade promotion agencies, representatives of local authorities, bankers, fund managers, business service providers, etc. from within and outside of the CEI Region.

The rationale of the CEI Summit Economic Forum (SEF) is to promote the CEI strategy of regional co-operation, European integration, economic transition and assistance to the least advanced member countries. The CEI programmes and projects in the various fields of activity are intended to contribute, within the overall CEI strategy of cohesion and solidarity in Europe, to the realisation of the three principal CEI objectives:

- to strengthen co-operation among Member States;
- to strengthen the process of economic transformation of the CEI countries in transition;
- to strengthen the participation of all Member States in the process of European integration.

Seventh CEI Summit Economic Forum – Portoroz 24-26 November 2004

The Seventh CEI Summit Economic Forum (SEF) concluded with great success and praise. While the beautiful backdrop of Portoroz lifted the moods of delegates and lightened discussions, many more were the attributes which guaranteed the success of the Summit Economic Forum. Firstly, a more focused and streamlined economic forum ensured very good quality panels and subsequent pertinent discussions. In their turn, the quality of sessions ensured a higher degree of visibility in the national and international media. **36 sessions** were animated by **210 speakers** with **1450 participants** and approximately **200 accredited journalists**. In addition, a further **28 presentations** took place in the **Project Room**. Participants were from **40 countries** (17 CEI member countries plus 23 non CEI). In addition, the Roundtable of 17 Economic Ministries was for the first time opened to the public and in so doing represented a good platform for deepening discussions on industrial policy and overall economic development in Europe.

The CEI Project Secretariat was the main organiser of the event, and its staff worked very hard so as to ensure that all aspects of Forum substance, preparation and operation were taken care of. The Executive Secretariat and its staff made substantial contributions. The Slovenian Presidency was the main host and promoter. The Italian Government was the main funding source. Slovenia, as a new member country of the European Union, has been a representative case of transition and change, and of the benefits of commitment to economic reforms. The **European Bank for Reconstruction and Development (EBRD)** also played a crucial role in the SEF.

The **Forum topics** were grouped into four main areas of interest called "SEF streams".

1. **Business Growth - Portorož Business Conference: Competitiveness, Social Responsibility and Economic Growth.**
2. **Infrastructure and Energy - Focus on Sustainable Development.**
3. **Financial Sector as a Service for Investment.**
4. **Entrepreneurship/ SMEs - The Only Answer to the Future.**

Besides formal sessions (grouped into the above mentioned four streams), one of the main SEF's activities was the so-called **Interactive Business Area (IBA):** the venue of many exhibitors, country and organization stands, business info desks, and the Project Room which included various activities such as Match-Making (arranging bilateral business meetings among SEF participants), and project presentations

mainly in the areas of transportation, infrastructure and support to SMEs. The audience was specific and project-oriented, thus enabling a close interaction with the project presenters.

CEI Youth Forum: On Issues of Primary Interest for the Young People

The first CEI Youth Forum was organised in 2001 concurrently with the Summit in Trieste and since then has evolved into the main annual CEI event in the field of youth affairs, each year taking place back to back with the Summit in the country of the CEI Presidency. Young people from all Member Countries (activists, entrepreneurs, young government officials etc.) gather in order to exchange opinions and experiences on various issues of interest to them, particularly those related to job opportunities, mobility, cooperation among youth across-borders etc. The Forum traditionally concludes with a declaration presented to the Heads of Government.

Co-operation with partners

Since by joining experience, knowledge and funds, the CEI can achieve a larger impact in its Member States, it has developed a variety of working relationships with partners throughout Europe. As regards the co-operation with the **European Commission**, the CEI Funding Unit has in the past period successfully applied for the support of the EU funds for CEI projects in areas such as information society, transport and SMEs. As regards the activities in the area of economic development, a close cooperation exists with several international financial institutions (**EBRD, World Bank, European Investment Bank**). Some of the successful programmes carried out with these partners are the CEI BAS (Business Advisory Services), TAM (Turn Around Management) and micro-credits for small farmers. In areas such as agriculture, environment, SMEs and transport, the CEI has been working with international organisations such as the **United Nations Industrial Development Office, United Nations Economic Commission for Europe, Organisation for Economic Co-operation and Development** and the **Food and Agricultural Organisation**. In the area of institution building and human development (culture, education, minorities, combating organised crime, cross-.border-cooperation, etc.) the CEI has developed contacts with other specialised organisations and forums, among them the **United Nations Educational, Scientific and Cultural Organization, the Organization for Security and Co-operation in Europe,** the **Council of Europe** and others.

The CEI has also established co-operative links with several **regional organisations and fora** operating within or adjacent to the CEI region, i.e. the **Adriatic Ionian Initiative**, the **Black Sea Economic Co-operation**, the **Danube Co-operation Process**, the **South East European Cooperation**

Process and the **Stability Pact for South-eastern Europe**. Regular co-ordination meetings of regional organisations aimed at avoiding an overlapping of activities and events as well as joining resources for common projects, are being organised either by the CEI or by other organisations.

The CEI and the OECD LEED Programme are currently collaborating on the development of the CEI-LEED Local Development Network (see Annex D).

For further information on CEI see www.ceinet.org and www.ebrd.com or contact the following people:

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ANNEX D

The CEI-LEED Local Development Network

The Central European Initiative (CEI) and the OECD Local Economic and Employment Development (LEED) Programme have joined forces to create the CEI-LEED Local Development Network (LDN). This is a network of local development policy advisors in Central, East and South East Europe which is currently being built. The advisor network will be a tool to access local expertise in the target countries, foster co-operation among national and sub-national local development practitioners, identify capacity building needs and advise on the activities of the Trento Centre and the CEI.

Objectives of the LDN

The objectives pursued with the Local Development Network (LDN) are to:

- *Identify and address capacity building* needs and activities in support of entrepreneurship and SMEs, local economic development, local governance, job creation, and social cohesion in Central, East and South East Europe.

- *Assess current practices* in the design, implementation and evaluation of policy instruments employed by national and sub-national authorities.

- *Share the knowledge base* of the OECD LEED Programme and contribute to best practice exchange amongst local development professionals in the target region.

- *Apply this knowledge base* for the direct assistance to local entrepreneurship.

- *Identify the priorities, action plans, training needs and development strategies* that are specific to each country participating in the LDN, using the advice of LEED and CEI structures and experts and partner organisations, in particular those that can speak for the recipient countries.

Membership

Approximately 10-15 institutions or individual professionals per country will be invited to participate in the LDN, including:

- Private sector SME consultants, managers of local banks dealing with SMEs and representatives of SME associations, SME support centres and business promotion organisations.

- Officers from the various tiers of government (central, regional, local) involved in local development.

- Representatives from non-governmental organisations and non-profit organisations.

- Staff in universities and research institutions.

- Members of the CEI structures involved in entrepreneurship and local development, including the BAS (Business Advisory Services).

A planning/steering group will be formed out of those participating in the Annual Assembly Meeting at the Summit Economic Forum (SEF), to include organisations with a greater involvement in the LDN activities during the year.

What does the LDN membership offer?

In addition to the Annual Assembly Meeting, organised in conjunction with the yearly CEI Summit Economic Forum, members of the LDN will have access and contribute to the following activities:

- International conferences and seminars on entrepreneurship, the social economy and local governance in Central, East and South East European countries, organised by the OECD LEED Trento Centre, the Stability Pact, the Investment Compact, the CEI/EBRD, and other relevant institutions.

- Capacity Building Seminars on entrepreneurship, the social economy and local governance for policymakers and practitioners from Central, East and South East Europe held at the OECD LEED Trento Centre for Local Development in Trento, Italy.

- Know-How Exchange (KEP) projects, co-organised by the LEED Trento Centre and the CEI to support capacity building and best practice exchanges in entrepreneurship, local development, and social innovation.

- Activities organised by the OECD LEED Forum on Partnerships and Local Governance, including seminars and a partnership fair.

Members of the LDN will have access to and support from the OECD LEED network of experts on local development. In many cases, travel costs may be provided for participants out of the existing budget mechanisms of LEED and the CEI.

For further information please contact the OECD LEED Trento Centre for Local Development www.Trento.oecd.org or the CEI Secretariat www.ceinet.org.

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Business Clusters

PROMOTING ENTERPRISE IN CENTRAL AND EASTERN EUROPE

Clusters of firms and related organisations in a range of industry specialisations are a striking feature of the economic landscape in all countries. Their growth and survival depends on internal processes of specialisation, co-operation and rivalry, and knowledge flows that underpin the competitiveness of the firms within them. Cluster building is now among the most important economic development activities in OECD countries and beyond. This book looks at the importance and potential of cluster initiatives in Central and Eastern Europe as these countries integrate ever more strongly into the global economy. Existing clusters are mapped, recent policy advances are described and conclusions are drawn on the potential of business clusters to foster economic growth in the wider Central, East and South East European region.

Do clusters only occur spontaneously or can they be formally encouraged? What role do public authorities play? What, if any, is the impact of specific national political and economic initial conditions on cluster development? Which policies work best? These are just some of the questions raised in this publication, which provides practical insights on clusters and cluster policies to governments, local development practitioners and entrepreneurs alike.

This publication is one of the outputs of a major programme of conferences and research on cluster building in Central and Eastern Europe led by the OECD LEED Programme in collaboration with the Central European Initiative and the European Bank for Reconstruction and Development.

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