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Coordinator of project:
Rheinische Friedrich-Wilhelms-Universität Bonn
Center for European Integration Studies (ZEI)
Bonn, Germany
Iulia TRAISTARU

Project's website:
http://www.zei.de/zei_alt/eurec/eureco.htm

Partners:
Institut für Weltwirtschaft an der Universität Kiel(IfW), Kiel, DE, Ruediger Soltwedel
Università Commerciale "Luigi Bocconi" (UNIBOC), Milano, IT, Laura Resmini
Economic and Social Research Institute (ESRI), Dublin, IR, Edgar Morgenroth
University of Thessaly (UTH), Volos, GR, George Petrakos
Institute for World Economics Hungarian Academy of Sciences (IWE), Budapest, HU, Andras Inotai
Institute of Economics, Bulgarian Academy of Sciences (BAS), Sofia, BG, Stoyan Totev

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PREFACE

Within the Fifth Community RTD Framework Programme of the European Union (1998-2002), the Key Action *"Improving the socio-economic knowledge base"* had broad and ambitious objectives, namely: to improve our understanding of the structural changes taking place in European society, to identify ways of managing these changes and to promote the active involvement of European citizens in shaping their own futures. A further important aim was to mobilise the research communities in the social sciences and humanities at the European level and to provide scientific support to policies at various levels, with particular attention to EU policy fields.

This Key Action had a total budget of 155 Million Euros and was implemented through three Calls for proposals. As a result, 185 projects involving more than 1600 research teams from 38 countries have been selected for funding and have started their research between 1999 and 2002.

Most of these projects are now finalised and results are systematically published in the form of a Final Report.

The calls have addressed different but interrelated research themes which have contributed to the objectives outlined above. These themes can be grouped under a certain number of areas of policy relevance, each of which are addressed by a significant number of projects from a variety of perspectives.

These areas are the following:

- ***Societal trends and structural change***
  16 projects, total investment of 14.6 Million Euro, 164 teams
- ***Quality of life of European Citizens***
  5 projects, total investment of 6.4 Million Euro, 36 teams
- ***European socio-economic models and challenges***
  9 projects, total investment of 9.3 Million Euro, 91 teams
- ***Social cohesion, migration and welfare***
  30 projects, total investment of 28 Million Euro, 249 teams
- ***Employment and changes in work***
  18 projects, total investment of 17.5 Million Euro, 149 teams
- ***Gender, participation and quality of life***
  13 projects, total investment of 12.3 Million Euro, 97 teams
- ***Dynamics of knowledge, generation and use***
  8 projects, total investment of 6.1 Million Euro, 77 teams
- ***Education, training and new forms of learning***
  14 projects, total investment of 12.9 Million Euro, 105 teams
- ***Economic development and dynamics***
  22 projects, total investment of 15.3 Million Euro, 134 teams
- ***Governance, democracy and citizenship***
  28 projects; total investment of 25.5 Million Euro; 233 teams
- ***Challenges from European enlargement***
  13 projects, total investment of 12.8 Million Euro, 116 teams
- ***Infrastructures to build the European Research Area***
  9 projects, total investment of 15.4 Million Euro, 74 teams.

This publication contains the final report of the project "The Impact of European Integration and Enlargement on Regional Structural Change and Cohesion", whose work has primarily contributed to the area *"Economic development and dynamics"*.

The report contains information about the main scientific findings of this project and their policy implications. The research was carried out by 7 teams over a period of 3 years, starting in November 2002.

This research project aimed to identify and explain the impact of European integration and enlargement on regional structural change and cohesion and to analyse the role of foreign direct investment in fostering economic activities and regional structural change. The research was undertaken through a cross country analysis covering Austria, France, Germany, Greece, Ireland, Italy, Portugal, Spain, Czech Republic, Poland, Slovakia, Slovenia, Hungary, Romania and Bulgaria.

The research noted that in the EU-15 Member States regional structural change has taken place at a slow speed: regional production structures are progressively converging to the EU-15 average level. At the same time, the integration process has not benefited all regions equally. There are regions that have lost out: especially regions highly specialised in resource dependent industries such as iron and steel industries, as well as in agriculture, were not performing well. The analysis of the spatial distribution of foreign direct investment (FDI) and the impact of this distribution on economic activity in the New Member States (NMS) revealed that competition for attracting FDI occurred among regions rather than countries. Indeed, FDI location choice is determined mainly by economic factors such as good infrastructures, skilled labour force, large domestic markets and a sound legal system.

In terms of policy implications, the research stressed the need for the implementation of policies aiming at speeding up the convergence of industrial structures in order to increase the cohesion between the regions: rather than focusing substantial funds on the support of the agricultural sector or in resource intensive industries, a reorientation of policies dealing with the transition costs for the reorientation of regions towards more sustainable industries should be pursued. It also pointed out that although FDI can offer a positive contribution to the growth of regions, it can not be considered as a substitute for regional development policies.

The abstract and executive summary presented in this publication offer the reader an overview of the main scientific and policy conclusions, before the main body of the research provided in the other chapters of this report.

As the results of the projects financed under the *Key Action* become available to the scientific and policy communities, Priority 7 "*Citizens and Governance in a Knowledge Based Society*" of the Sixth Framework Programme is building on the progress already made and aims at making a further contribution to the development of a European Research Area in the social sciences and the humanities.

J.-M. BAER,
Director

EURECO

Research Team

Iulia Traistaru-Siedschlag (ZEI), Project co-ordinator
Jürgen von Hagen (ZEI)
Anna Iara (ZEI)
Eva Kippenberg (ZEI)
Speranta Pirciog, National Research Institute for Labour Market, Bucharest
Bernd Brandl, University of Vienna
Christian Fölzer, SGC, Vienna
Rüdiger Soltwedel (IfW), Coordinator Workpackage 2
Christiane Krieger-Boden (IfW)
Eckardt Bode (IfW)
Florian Siedenburg (IfW)
Laura Resmini (UNIBOC), Coordinator Workpackage 4
Carlo Altomonte (UNIBOC)
Fazia Pusterla (UNIBOC)
Claudia Guagliano (UNIBOC)
Chiara Bonassi (UNIBOC)
Maria Giovanna Bosco (UNIBOC)
Stefano Riela (UNIBOC)
Edgar Morgenroth (ESRI), Coordinator Workpackage 5
John Bradley (ESRI)
Natalie Lubenets (ESRI)
George Petrakos (UTH), Coordinator Workpackage 3
Georgios Fotopoulos (UTH)
Dimitris Kallioras (UTH)
Andras Inotai (IWE)
Tamás Szemlér (IWE)
Andrea Szalavetz (IWE)
Anna Wisniewski (IWE)
Stoyan Totev (BAS)
Nikolai Chkorev (BAS)
Mitko Dimitrov (BAS)

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Abstract

The overall scientific objective of this project was to identify and explain in a cross-country analysis the impact of deepening and widening of economic integration on regional structural change and cohesion in current European Union (EU) member states and accession countries. A summary of our main research results is given below. These findings provide a basis for the evaluation of the likely overall allocation and distributional implications of deepening and widening of the EU and of policy at European, national and local levels.

In the *EU-15* member states regional structural change has taken place at a slow speed. Regional production structures are converging to the EU-15 average level, so that more specialised regions are becoming more diverse and less specialised regions are becoming more specialised. In terms of the regional performance, those regions that are highly specialised in resource dependent industries such as iron and steel industries, and agriculture, are not performing well, and one might consider these regions as losers from the integration process. On the other hand, central regions tend to perform above average, while remote regions appear to be catching-up. Semi-central and semi-remote regions show a very mixed picture.

An initial high specialisation at the regional level had a negative impact on employment growth. This negative relation can be observed, in particular, in regions specialized in resource dependent and industries with increasing returns to scale. The significantly negative industry-specific specialization-growth nexus did, however, generally not translate into a negative aggregate specialization-growth nexus.

The analysis for the EU *new member states* (NMS) and *Romania and Bulgaria* shows that those regions that have a high proportion of employment in the secondary and tertiary sectors, and that are less specialised tend to have the highest per capita GDP levels. These regions tend to be internal regions, capital city regions or regions with a direct border to the EU-15, suggesting that agglomeration and location are important determinants for the performance of the regions of the NMS. This suggests a taxonomy of winning and loosing regions since the converse is true for the other regions.

There has also been a distinct divergence among NMS regions. This finding is not dependent on the spatial scale of the countries. Again, this suggests that the integration process has not benefited all regions equally, and that there are loosing regions.

An important part of our research was to investigate the spatial distribution of *foreign direct investment* (FDI) and the impact of this distribution on economic activity in the NMS. FDI is spread widely in geographical terms but some concentrations emerge at the country and region level. From a sectoral perspective, it is noticeable that high-tech foreign firms are less numerous than low tech ones, representing no more than 30% of the whole sample. The economic factors that are important in attracting FDI are good macro-economic fundamentals, good infrastructures, skilled labour force, large domestic markets and a sound legal system. National boundaries do not play a significant role on FDI location patterns. From a policy perspective this result is extremely important since it indicates that competition for attracting FDI occurs among regions rather than countries.

1. Executive Summary

Project Scientific Objectives

The overall scientific objective of this project was to identify and explain in a cross-country analysis the impact of deepening and widening of European integration on regional structural change and cohesion. Our research aimed at the following detailed objectives: a) providing empirical evidence from EU -15 in a comparative and historical perspective on the effects of economic integration on regional structural change and cohesion; b) providing empirical evidence from the new EU member states and accession countries about the impact of economic integration with the EU on regional structural change and cohesion in these countries; c) providing empirical evidence about the role of foreign direct investment in fostering agglomeration of economic activities and regional structural change; d) deriving in a coherent framework policy implications of predicted spatial economic changes of the European integration for policy at the European, national and regional levels.

Policy Relevance

These research questions are policy relevant for at least three reasons. First, economic integration is essentially a reallocation of resources across sectors and space expected to result in changes of production structures. While these changes bring aggregate efficiency gains these gains may not be evenly distributed across space and sectors and, moreover, short - term adjustment costs may be important. This structural change has thus an impact on welfare. Second, to the extent that there are industry-specific shocks, changes in patterns of specialization at regional level have an impact on the probability of asymmetric shocks which in turn has an impact on the net benefits of the European Monetary Union. Third, to the extent that changes in production structures affect regional economic performance, these changes affect the economic cohesion at the EU and national levels.

Theoretical Framework

The theoretical framework of this empirical analysis has included both traditional trade and growth models based on constant returns to scale and perfect competition and in particular more recent models of economic geography and endogenous growth theory based on increasing returns to scale and imperfect competition.

Added Value

Over the past two decades there has been a growing interest in the analysis of spatial implications of economic integration via trade and foreign direct investment. The explanation for this increased interest is twofold: first, because of the policy relevance of this analysis as outlined above. Second, because of insights from new theoretical trade and growth models. There are already several studies most of them cross-country. However, the changes of production structures at regional level in the context of economic integration have been little investigated so far. Our contribution is threefold:

First, we contribute to filling this gap in the literature by bringing novel empirical evidence on spatial implications of integration from EU-27 regions. Second, we use disaggregated national data sets including firm-level data and comparable EU-25 data sets. Third, this project has an European dimension and fostered the creation of an international research network on integration and regional structural change which has stimulated further research collaborations.

Summary of Project Scientific Results

In summarising the empirical findings we distinguish between the EU - 15 and the New Members States (NMS). This distinction is important since on the one hand the EU-15 have been subject to a more gradual integration process over a longer period while on the other hand the NMS have had to adjust to the disintegration of the COMECOM and the resulting structural change as they moved towards market economics and the subsequent integration into the EU which is not complete. The EU-15 countries that were chosen to be analysed in more detail are Austria, France, Germany (East and West), Greece, Ireland Italy, Portugal and Spain. The NMS we focused on are Bulgaria, Czech Republic, Poland, Romania, Slovakia, Slovenia, and Hungary. While neither Romania nor Bulgaria are member states of the EU, they are nevertheless included here among the set of NMS since their accession is expected in the short-run.

Slow regional structural change and convergence in the EU-15

Overall, economic activity is very *dispersed* in the EU-15 countries and is closely related to the distribution of the population. This applies to broad economic sectors (agriculture, manufacturing, construction, services) as well as the majority of the industries within the manufacturing sector.

Structural change in the EU-15 is largely accruing at a very slow speed. If at all the structures are converging to the EU-15 average level, so that more specialised regions are becoming more diverse and less specialised regions are becoming more specialised. In terms of the regional performance, those regions that are highly specialised in resource dependent industries such as iron and steel industries, are not performing well, and one might consider these regions as losers from the integration process. On the other hand, central regions tend to perform above average, while remote regions appear to be catching-up. Semi-central and semi-remote regions show a very mixed picture.

Considering the degree of *concentration of industries*, that is the degree to which particular industries are concentrated in particular locations, slightly higher degrees of concentration prevailed in agriculture and related food-processing industries, which are of course more closely associated with more rural regions rather than urban agglomerations. Similarly resource-based industries such as mining and steel industries are more concentrated since natural resources are only found in certain locations. Finally, manufacturing industries, which are subject to localization economies are also more concentrated (e.g. Mining, Iron and Steel). By contrast, several of the manufacturing industries that are usually regarded as being subject to firm-specific increasing returns to scale are not found being systematically higher concentrated than other industries.

Considering the empirical evidence as a whole, there appears to be no strongly defined trend towards increased concentration or indeed de-concentration. There appears to be a slight tendency towards de-concentration among most industries, including agriculture and food processing as well as industries subject to firm-specific increasing returns to scale.

The degree of concentration of industries depends on *industry characteristics*. Thus, all industries were categorised into three groups: increasing returns; resource intensive; and footloose. In general the *resource intensive* industries are most concentrated which is not surprising since they are dependent on resources, which are only available in some locations. On the other hand *footloose industries* are least concentrated which accords well with their status as footloose, since this status implies that they are not dependent on any localised factor and thus can locate almost anywhere. Interestingly, *increasing returns to scale* industries are not always found to be particularly concentrated.

The evidence on the degree of *specialisation*, that is the degree to which a region is dominated by specific industries suggests that most regions in the EU-15 are sectorally diversified with respect to their portfolio of both broad economic sectors and industries within the manufacturing sector. This is true in particular for Austria, West Germany and France. However, on the one hand, core regions, such as Paris, Madrid, Vienna, Rome and Hamburg, and on the other hand, peripheral regions such as Algarve, Sicilia, Aegean Islands, Bretagne, Burgenland, the Irish Midlands and Schleswig-Holstein, tend to be somewhat more specialised.

Any changes in regional specialisation patterns during the analysed period occurred at a very slow pace. Those regions that are located within countries that had a high level of specialisation tended to show a decrease in specialisation. More generally, the relationship between the initial specialisation level and subsequent change of specialisation was usually negative. This suggests convergence in terms of the broad level of specialisation across regions and thus a reduction of any core-periphery pattern in terms of industrial structure compared to the start of the period.

Core-periphery pattern

Clearly not all regions are the same and it is possible to group regions into some broad categories which allow a comparison across these categories. Regions are grouped together according to their industrial structure, resulting in five separate categories, which are found to share further characteristics in common, particularly regarding their geographic situation. Accordingly they can be earmarked as central; semi-central; highly industrialised; peripheral and semi-peripheral, regions, thus reflecting a core-periphery pattern based on a characteristic distance-related division of labour.

Firstly, given the importance of a core-periphery pattern in the New Economic Geography literature, it is useful to consider *central* regions. These are particularly important in monocentric countries and these central regions tend to be more specialised in knowledge intensive industries. Secondly, regions proximate to these central regions (*semi-central*) may benefit from spillovers from the central regions so these are also

identified. Apart from the central regions, which tend to contain accumulations of knowledge intensive industries, *highly industrialised* regions can often also be identified. These are usually focussed on manufacturing and, more particularly, on resource dependent industries, are usually situated at the borders towards Central Europe (France, Portugal, Spain, Italy).

Peripheral regions tend to have a more basic industry mix, focusing more on resource intensive industries, agriculture and footloose industries can also be identified. These are usually situated at the external EU borders. Of course some regions have an industry mix characteristic of both peripheral and highly industrial regions, and they may be referred to as *semi-peripheral*.

Overall, this analysis does not yield evidence in favour of the New Economic Geography literature, since there is no dramatic specialisation trend, where trade leads to agglomeration of industries only close to main markets. Thus, while some weak evidence of a core-periphery pattern can be found with regard to the spatial dimension of the interregional division of labour, there appears to be no clear evidence for the "catastrophic scenario" that is characteristic for many NEG models: No increasing specialization of core regions with foci on IRS industries and no increasing specialization of peripheral regions with underrepresented IRS industries was found. Also, no deepening of the core-periphery pattern in terms of specialisation could be observed.

Specialisation and economic performance in the EU-15

In terms of their *output performance*, the *highly industrialized regions* in the EU-15 appear to be falling behind over the observation period of the 1980s and 1990s. Thus, they experience low growth and end up with below-average per-capita incomes. This is consistent with the view that the more traditional and often heavy industries have not been performing well. The *central regions* realised above-average income levels and grew fast in France and Spain, or at least medium in Germany and Ireland. The remote *peripheral* regions appear as catching-up regions; they tended to reveal medium to high growth rates but still realised only below-average income levels. *Semi-peripheral* and *semi-central* regions, however, behaved differently in the different countries: In the case of France, they showed no uniform growth or income characteristics. In the case of Spain, they appeared to develop less dynamically than other regions, and the two groups seemed separated by their different income levels (higher for semi-central regions, lower for semi-peripheral regions). By contrast, in the case of West Germany, they usually realized quite high growth rates during the 1980s and 1990s, and reached medium to high income levels. For East Germany, no comparable relations can be detected. For Ireland the semi central region and the semi peripheral regions with the exception of one, have performed above average. However, the best performing region was the one semi-central region, which benefited from significant spillovers from the central region (Dublin).

Overall, the change in specialisation in particular industries and employment change in these industries are positively correlated, implying that the reduction in the level of specialisation is due to a decline of these industries at a regional level.

Thus one can conclude that an initial high specialisation at the regional level had a negative impact on employment growth. This negative relation can be observed, in particular, in regions specialized in resource intensive and IRS industries. The significantly negative industry-specific specialization-growth nexus did, however, generally not translate into a negative aggregate specialization-growth nexus: There is little evidence from the descriptive analysis of a high initial specialization onto single industries, or a comparatively high aggregate specialization generally shaping aggregate regional employment growth to a notable extent.

Deep regional structural change and divergence in the NMS

Since the NMS have been subject to radical changes in their economic systems, moving from a centrally planned economy to a market economy and the associated trade re-orientation, it is particularly interesting to consider the trends of *regional specialisation* and *sectoral concentration* in the NMS.

The analysis for the NMS shows that those regions that have a high proportion of employment in the *secondary* and *tertiary* sectors, that are less specialised tend to have the highest per capita GDP levels. These regions tend to be *internal regions*, *capital city regions* or *regions with a direct border to the EU-15*, suggesting that agglomeration and location are important determinants for the performance of the regions of the NMS. This then yields a simple taxonomy of winning and loosing regions since the converse is true for the other regions.

Importantly, there has also been a distinct *divergence* among NMS regions. Indeed this finding is not dependent on the spatial scale of the countries. Again, this suggests that the integration process has not benefited all regions equally, and that there are loosing regions.

In the Czech Republic both absolute and relative concentration declined but the decline in absolute concentration being very modest. The sectors that were found to be most concentrated in 1993 were financial intermediation, real estate renting and business activities and other community, social and personal services. In general the rankings of the various sectors remained roughly stable regarding both absolute and relative concentration. The only exception is the hotels and restaurants sector which while having an average level of concentration in 1993, experienced a significant decline of concentration so that in terms of ranking this sector went from being the fourth highest to the third lowest.

High concentration for all sectors was found in Poland, and these stayed constant for most sectors. Increasing absolute concentration was found for Agriculture, forestry and fishing, Transport Storage and Communications and Financial Intermediation. Real Estate Renting and other Business Activities was the only sector to have decreased in concentration. With regard to relative concentration increasing indices are found for 6 of 11 sectors. The only sector to have a declining index of relative concentration were Public Administration and Real Estate and Renting.

In Hungary absolute specialisation decreased for most sectors while relative concentration increased. Notable is particular the reduction of concentration of the machinery sector which spread throughout the country. A interesting result is that there is a negative correlation between absolute concentration and industry level growth.

For Bulgaria low levels of absolute concentration were found for 1990 but there was a slight increase until 2001. As might be expected the highest absolute concentration was found for the energy sector. The most striking finding was the significant increase of the index of absolute specialisation for the Transport Equipment sector where the Herfindahl index increased from 0.08 to 0.17. Relative concentration increased slightly over the period. Again a significant increase was found for the Transport Equipment sector but a similar increase is also found for the Basic Metals sector. On the other hand the Rubber and Plastic sector experienced a significant decline in relative concentration

The results for Romania also indicate low absolute concentration, which remained constant over time. High levels of concentration were found for Leather and Paper industries and a low concentration was found for in Food, Textiles and Wood. A slight increase of relative concentration was observed wit the highest index being that of Machinery and Electrical and Optical Equipment.

For the Slovak Republic the analysis was limited by the fact that just four regions could be distinguished. In general the level of concentration was found to be low with little change except the increase of the energy sector, which was concentrated more in Western Slovakia.

In the Czech Republic absolute and relative specialisation declined slightly. With regard to absolute specialisation no convergence of specialisation levels is seen, but for relative specialisation slight increase in differences occurred between 1993 and 2001. Prague has the lowest absolute level of specialisation but the highest level of relative specialisation, reflecting the importance of the heavy industries, agriculture and services in determining the patterns of specialisation. Absolute specialisation increased in 4 regions bordering Germany and Austria.

Bulgaria was characterised by increasing absolute specialisation with divergence between regions. An exception is the most developed South West of the country where specialisation did not increase. Relative specialisation increased over time and again this was subject to diverging trends among the regions. Among the regions that have a high level of relative specialisation two types can be identified. On the one hand there are those regions that have at least one very strongly performing industry and thus good overall economic performance while on the other hand some poorly performing regions also have a high level of specialisation. The latter also tend to be regions, which have failed to attract FDI.

In Hungary absolute specialisation increased in 14 out of 20 regions. Of the six that either had a constant or decreasing level of absolute specialisation four are located in the south of the country, the others being the capital city region and one western region. In contrast, relative specialisation decreased in three quarters of the regions. These changes were

particularly driven by the fact that machinery became a more important sector while food declined in importance.

Overall absolute specialisation levels have not changed substantial, which might be due to the slow modernisation in agriculture, the slow pace of privatisation and the reluctance of government to restructure heavy industries. The highest specialisation levels are found in the eastern more rural regions and the capital region. Relative specialisation varies substantially between regions but there has been little change over time in the indices. Again the eastern regions have the highest level of relative specialisation.

Absolute regional specialisation increased marginally in Slovakia over the period 1995 to 1999 and the regions appear to be converging in the degree of specialisation. However, there was a marked increase in absolute specialisation between 1999 and 2000, with increasing differences between the regions. This is particularly true for the Bratislava region. Relative specialisation also increases slightly over time. Again Bratislava has the highest level of relative specialisation.

A low average absolute specialisation level was found for Romania with no pronounced spatial pattern apparent. Nevertheless, less highly specialised regions included the capital city regions and more western regions plus one region on the Black Sea coast. In the most highly specialised regions one manufacturing branch typically accounted for 40% or more of employment. There has been a statistically significant increase in absolute specialisation over the period 1992 to 2001, but this was not uniform over all years, rather in some years the index increased while it decreased in other suggesting that individual events regarding the main employers might be the driving force for the changes. Overall 31 of the 41 regions experienced an increase in absolute specialisation. The 10 regions that experienced a decline in specialisation are to be found grouped in the West, the Centre and the North of the country. In general specialisation levels have been diverging. High relative specialisation was found in South-East, South-West and South. In general relative specialisation increased, but the differences in the degree of regional specialisation declined so that the indices were converging.

An interesting consideration is to what degree the changes in the NMS have resulted in the industrial structure of these countries becoming closer to that of the EU-15. This was examined using an *index of dissimilarity*. This analysis showed that the industrial structure of Hungary and Bulgaria is diverging from the EU-15 structure, while that of Slovenia is converging to the EU-15 structure. No clear trend is obvious for Romania, which seems to be keeping a constant level of dissimilarity relative to the EU-15. Thus, one can conclude that with the exception of Slovenia, the *structural change* due to integration has forced the countries to specialise in sectors in which their new trading partners in the EU 15 were not specialised.

This analysis finds support for the *agglomeration effects* of the New Economic Geography models since internal regions (those that do not border other countries) and the capital city attract the majority of economic activities. Furthermore, *capital-intensive* sectors are only concentrated in capital cities, internal regions (those not bordering other countries) and regions that border the EU-15. As a general rule among the manufacturing

industries the regions of the NMS tend to be more specialised in *labour intensive* activities, which reflects comparative advantage since labour costs are considerably lower in NMS. These patterns are also apparent in a dynamic analysis of the specialisation patterns.

Specialisation and regional performance in the NMS

Integration is closely related to the levels of per capita GDP and thus, those regions that are more integrated into the EU have a level of per capita GDP that is closer to the EU-15 average than those that are less integrated. The same is also true for those regions that are closer to the EU-15. Those regions that were most able to maintain their share of manufacturing employment relative to other sectors also had a higher per capita GDP than those that lost a significant proportion of their manufacturing sector. This of course may well be due to the fact that they had a more competitive manufacturing sector to start with. On the other hand a high share in the services sector is also associated with high levels of GDP. This implies that regions with a high reliance on the primary sector do not tend to perform well economically.

It is also important to consider how the *regional inequalities* within the NMS have changed over time. The time span over which these comparisons are possible are short but given the nature of the transition process this is nevertheless a useful exercise. Indeed the analysis shows that the degree of regional differences in terms of per capita GDP have increased in all countries between 1995 and 2000.Thus, the transition process has led to increased disparities within the NMS.

The growing dissimilarity between the industrial structure of the NMS and the average EU-15 that was highlighted above might be also reflected in the evolution of income and output measures. The analysis of this relationship reveals that more diversified regions have a higher per capita GDP than those that are more specialised. Those that least changed their structure also have the highest per capita GDP.

FDI, Industrial Location and Regional Development

Foreign direct investment (FDI) has been an important source of employment and growth in a number of countries. For example, it is well known that FDI contributed significantly to the recent growth miracle in Ireland. Consequently, many of the NMS have sought to attract FDI in order to support the privatisation of existing industries or to develop new ones. FDI is a source of capital, advanced management techniques, new organisation forms, skills and new technologies. FDI inflows, if sufficiently large and spatially differentiated, can have a significant impact not only on aggregate growth but also on the regional distribution of industries. Thus, an important part of our study was to investigate the spatial distribution of FDI and the impact of this distribution on economic activity.

FDI is heavily concentrated

FDI is spread widely in geographical terms but some concentrations emerge at the country and region level. In general, FDI is most *heavily concentrated* in Hungary and the Czech Republic, while Poland, Romania and Bulgaria still lag behind. From a

sectoral perspective, it is noticeable that high-tech foreign firms are less numerous than low tech ones, representing no more than 30% of the whole sample. An interesting feature of the sectoral distribution of firms across space is that high-tech foreign firms prefer to locate in Hungary or the Czech Republic, while low tech foreign firms concentrate are particularly concentrated in Romania.

Within each country except Bulgaria, some regions emerge as *favourite location* for foreign firms. These include the capital districts, the three North-Western Hungarian regions lying between Budapest and the Austrian border; the North-Western part of Romania, and particularly some western regions in Poland. These patterns have changed over time. While at the beginning of the period several Polish regions had concentrations of FDI of at least one standard deviation above the average, in 2001 only three regions maintain this concentration. The opposite trend characterized Romania regions. Thus, it is reasonable to conclude that Poland has at least partially lost its initial advantage in FDI attractiveness in favour of Romania.

FDI location choice determined mainly by economic factors

Given these results it is also important to consider the *location factors*, which attract FDI. The *economic factors* that are important in attracting FDI are good macro-economic fundamentals, good infrastructures, skilled labour force, large domestic markets and a sound legal system. An econometric study conducted as part of this project analyse the location choice of about 4,000 MNEs in Bulgaria, Hungary, Romania and Poland and confirms firstly the *predominant role played by economic factors* and, secondly, that the *relative importance* of the economic factors as determinants of FDI *differ according to the industry*. In particular, *high tech foreign firms* seem to be attracted by market potential, degree of connectivity with neighbouring markets, and agglomeration economies emanating from other foreign firms. *Low-tech foreign firms*, instead, look for a more complex set of location advantages. Apart from those mentioned in the case of high-tech foreign firms, it also includes the cost and the availability of skilled labour force and the possibility of interacting with domestic firms. Quite surprisingly, country risk does not decrease the probability of a location to be chosen by a MNE. This confirms that markets compensate high risks with high profits.

Competition for attracting FDI occurs among regions rather than countries

The most innovative result of this study, however, refers to how foreign firm choose the final location within a large set of possible alternatives. What emerges is that national boundaries do not exert any effect on FDI location patterns. The choice of foreign firms is not between Poland and Romania, for examples, but between groups of similar regions. High tech and low-tech foreign firms perceive this "similarity" differently. The former, in choosing a location for their production plants, consider three different types of regions: the capital cities, the regions bordering with the EU, and all other regions; the latter, instead, simply consider whether a region is member of the EU or not.

From a policy perspective this result is extremely important since it indicates that competition for attracting FDI occurs among regions rather than countries. Therefore, each region should be aware of which are its more direct competitors before implemented any policy for promoting FDI.

Weak technological spillovers and linkages with domestic firms

The uneven spatial and sectoral distribution of FDI has changed regional specialization and increased regional growth rates. However, it has not been able to reduce regional inequalities across and within countries, because of the weakness of technological spillovers and input output linkages with domestic firms. Some of these results are consistent with previous studies on the topic; others, instead, are quite new and offer interesting insights both to policy makers and scholars for further researches.

Policy Implications

These research results suggest that policy should tackle a number of issues.

Given the slow speed of diversification it is reasonable to consider that policies be introduced that *speed up the convergence of industrial structures* since this could benefit the speed of convergence. This conclusion also corresponds with the observation that those regions that are more focused on the primary sector, which implies a significant difference from the average industrial structure, have performed poorly. Thus, rather than focusing substantial funds on the support of the agricultural sector, *a reorientation of these resources towards more advanced sectors* could help reduce regional disparities. Similarly, regions that are specialised in resource intensive industries appear to be performing poorly, and instead of supporting these industries, *policies that deal with the transition costs for the reorientation of regions towards more sustainable industries*, should be pursued. An important focus of this reorientation should be placed on *training and other labour market initiatives* that would overcome hysteresis effects.

In terms of the EU structural policies these recommendations imply that for the EU-15 these should not be focused on traditional resource intensive industries, which are declining. Rather, they should aim *to diversify the industrial structure* and in particular aim *to promote knowledge intensive activities* (which should be supported by appropriate human resource and infrastructure investments).

With regard to FDI the results suggest that there is a bias in the NMS towards low-tech manufacturing sectors. This implies that the technological transfer from foreign to domestic firms might be limited in scope. Consequently, the contribution of FDI to sustain growth in the long run may be limited. Moreover, low-tech foreign firms are more footloose and less embedded into the local economy than high-tech foreign firms, further raising doubts about the long-run contribution of FDI in the NMS. This is due to the fact that cost advantages, and mainly, labour cost advantages, reduce over time, because of the improvement in the labour standards due, among other things, to the implementation of the *acquis communautaire*. This might become a severe problem for Romania and Bulgaria. Numbers are important, but what matters the most is the *quality* of FDI, i.e. foreign firms embedded into the local economy, which can ensure a good transfer of technology and know - how to domestic firms.

Thus, *linkages should be further stimulated* by appropriate policy interventions. In order to increase their effectiveness, linkages should however be targeted to domestic firms rather than foreign firms. Stronger local firms not only attract FDI but are also able to exploit benefits emanating from them.

Once foreign firms decide to locate in a particular country, economic determinants are more important than policy factors for their location. Thus, the right instruments to attract FDI are policy interventions aiming at *improving market access, infrastructures, labour market conditions*, etc. rather than granting fiscal and financial incentives.

Finally, FDI alone does not suffice to foster regional growth and generate convergence processes within countries. In other words, they cannot be considered as a substitute for regional development policies. They can offer a positive contribution to growth and development of laggard regions when integrated into a broader regional development strategy.

In addition to their traditional efforts to attract FDI – i.e. sound stabilization policies, improving the functioning of the financial systems, the provision of new infrastructures within international networks, etc – new member states might consider more pro-active measures to help maximize long term dynamic FDI benefits. This implies *to strengthen domestic firms* so that they can compete with foreign enterprises or become more active partners in upstream and downstream operations, improve innovation system and the absorptive capacity of domestic firms. These policies are likely to improve the attraction of high-quality foreign firms and avoid the emergence of FDI enclaves.

2. Background and Objectives of the Project

Since the foundation of the European Economic Communities in 1957 there has been an ongoing process of deepening and widening of economic integration. This process was accelerated in the 1990's through the introduction of the Single European Market (SEM) and European Economic and Monetary Union (EMU), which culminated in the introduction of the Euro. Simultaneously, with the collapse of the communist regimes in Central and Eastern Europe (CEE), a process of enlargement of the European Union (EU), which was unprecedented in scale, was set in motion which culminated with the accession of 10 new member states (NMS) into the European Union (EU) in 2004.

The enlargement of the European Union towards the Central and East European countries is likely to change the international and interregional division of labour and the location of industry, increase the diversity and affect the regional cohesion in Europe. Existing evidence indicates that trade re-orientation towards the European Union has taken place among all member states, albeit with different magnitudes. In the NMS, integration accelerated in the run-up to the entering into force of the Europe Agreements. It is however little known whether and to what extent patterns of industrial location and regional specialisation have changed due to increasing economic integration with the EU and what impact this change has had on regional income and cohesion in the enlarged EU.

As is highlighted in the EU Cohesion Reports, economic activity is not spread evenly across space within the EU, and indeed the heterogeneity within countries is often greater than that between countries, especially for the old member states (EU-15). According to the European Commission (2004), large regional disparities remain, and, at least with respect to unemployment, they increased substantially since the late 1970s (Martin 1998). During the whole integration process and despite long-standing and substantial policy efforts, some regional disparities appear to be rather tenacious. Given the recent enlargement it is important to consider whether some regions of the NMS might also fall into such an underdevelopment trap. Moreover, there is a substantial lack of knowledge with respect to the regional impact of integration. In particular, the specific effects on the division of labour between European regions and on industrial location and regional specialisation have not been addressed sufficiently and in-depth so far[1]. Exceptions to this are a number of studies that attempt to investigate the determinants of manufacturing location across countries: Amiti, (1999); Haaland et al (1999); Midelfart-Knarvik et al (2000); characteristics of spatially concentrated industries are analysed in Brülhart and Torstensson, (1996); Brülhart, (1998).

Indeed, an empirical analysis of these effects is also warranted since alternative theoretical approaches yield very different results so that one cannot say a priori what the likely impact will be. According to the neo-classical trade theory, economic integration fosters the division of labour according to comparative advantages, which raises the overall welfare as well as the welfare of each country or region involved in the process,

[1] While there are many studies on the degree of industrial specialisation, these studies have by-in-large not focused on the underlying determinants of specialisation.

and equalises factor prices. In this analytical framework, it was taken for granted that convergence of countries and regions is to be expected. Thus, regional policy could only speed up a convergence process, which would presumably happen anyway. Otherwise the role for government is merely to ensure that markets work well.

However, more recent strands of economic theory like the new trade theory, the new economic geography (NEG), or the new strand of theory on the role of foreign direct investment (FDI) which allow for market failures and externalities, often predict a lack of convergence and persistent differences in income per capita which can only be overcome by more substantial policy interventions. In these models factor prices do not equalise and while free trade is globally welfare improving, not all regions will gain.

The overall scientific objective of this project is to identify and explain in a cross-country analysis the impact of European integration and enlargement on regional structural change and cohesion. An important innovation in this project is the use of more disaggregated data with respect to both the sectoral and spatial level of disaggregation. The lack of disaggregation in the few previous studies severely reduces their usefulness for policy analysis since specialisation is a very localised phenomenon and cannot be picked up at the national level or macro-region level.

The analysis conducted in this project provides empirical evidence about the relationship between industrial location, regional specialisation and regional income per capita in the context of European integration and EU enlargement. These findings are summarised in this report. Furthermore, this report highlights the policy conclusions and recommends policy interventions and changes to existing policy.

The continual enlargement of the EU is reflected in the sample of countries that are analysed in this study, namely Austria, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Romania and Spain. These countries joined the EU at different points in time. Countries such as Italy, West Germany and France were founding members in 1957. Ireland joined in 1973 and Greece in 1981. Portugal and Spain joined in 1986. Finally, Austria, joined in 1995. All these countries are referred to here EU-15. Among the new Member States the Czech Republic, Hungary, and Poland, joined the EU in 2004 while Bulgaria and Romania are expected to join on 1 January 2007.

The overall scientific objective of this project was to identify and explain in a cross-country analysis the impact of deepening and widening of European integration on regional structural change and cohesion. Our research aimed at the following detailed objectives: a) providing empirical evidence from EU -15 in a comparative and historical perspective on the effects of economic integration on regional structural change and cohesion; b) providing empirical evidence from the new EU member states and accession countries about the impact of economic integration with the EU on regional structural change and cohesion in these countries; c) providing empirical evidence about the role of foreign direct investment in fostering agglomeration of economic activities and regional structural change; d) deriving in a coherent framework policy implications of predicted

spatial economic changes of the European integration for policy at the European, national and regional levels.

The objectives outlined above have been pursued in five co-ordinated and complementary workpackages. In *Workpackage 1("Comprehensive theoretical and methodological framework";* Lead partner: the Center for European Integration Studies, University of Bonn) the research team developed a comprehensive theoretical and methodological framework for the research. Relevant existing literature was reviewed and discussed as well as characteristics of data sets, statistical indicators, hypotheses to be tested and empirical methods to be used. *Workpackage 2* ("Regional structural change and cohesion in the EU"; Lead partner: the Institute for World Economics, University of Kiel) identified and explained structural changes of the inter-regional division of labour in the process of European integration, in particular looking at earlier EU enlargements. The relationship between regional specialisation, per capita income and growth was in particular investigated. *Workpackage 3* ("*Regional structural change and cohesion in the accession countries*"; Lead partner: University of Thessaly Volos) investigated the impact of EU accession on regional structural change and cohesion in the new EU member states and accession countries over the last decade. In particular, the research team identifed and explained the relationship between specialisation at regional level, geographical concentration of industrial activity and regional per capita income. *Workpackage 4* analysed the role of foreign direct investment in relocating industrial activity and "*The role of FDI in the relocation of industrial activities*"; Lead partner: University "Luigi Bocconi" Milan) fostering agglomeration of economic activity and regional structural change. Based on the empirical findings from the previous workpackages, *Workpackage 5* ("*Policy implications for the EU enlargement*"; lead partner: the Economic and Social Research Institute Dublin) discusses economic challenges and opportunities that deepening and widening European integration is posing for EU policy in particular, but also national and regional policies.

3. Scientific Description of the Project Results and Methodology

Theoretical and Empirical Background

Before we summarise the empirical findings of the research project it is useful to consider the theoretical literature in some more detail. This will help in drawing conclusions about the validity of these from the empirical literature, which was one aim of the project. The issue of regional convergence can be viewed from a number of theoretical perspectives. The results of these theories are closely determined by the assumptions made regarding sectoral and inter-regional labour mobility.

Traditional trade theory

Traditional trade theory provides a starting point for discussion of these issues. The most basic trade model, the Ricardian model envisages two countries/ regions, which differ in terms of their technologies so that one has a more efficient technology to produce a certain good than the other country. Assuming that there are two countries and just two products the countries/regions specialise in the product they have a comparative advantage in. In this case this means that a country will specialise in the production of that good for which it has the most efficient technology relative to the other country. The other good is produced by the other country/region even if the first country has a better technology for this product as well. It can be shown that trade is welfare improving for both countries as specialisation allows both countries/regions to consume outside their production sets.

The Ricardian model predicts full specialisation, which is of course highly artificial. Furthermore, trade in itself can transfer technology so that it might be more reasonable to assume that technologies are identical (at least for similar countries/regions) and that factor endowments differ, which is the assumption of the Heckscher-Ohlin (H-O) model. The standard H-O model has two sectors and two factors of production and two regions/countries. In this case it is thus not technology that determines what a country specialises in but factor abundance. Thus, countries/regions export the good, the production of which has a higher requirement for the factor of production that is most abundant in that country/region. Countries/regions need not specialise perfectly in this case. Importantly, in the absence of full specialisation trade will equalise product prices and factor returns internationally, provided trade is free of impediments. If the assumption of regionally immobile production factors is removed regional incomes would converge since factors would migrate to capture higher returns which would eventually lead to equalisation of returns.

A further extension of this model is to allow only one of the factors to be mobile between sectors (international factor mobility is ruled out in these simple examples given here). This is often referred to as the Specific Factors or Ricardo-Viner model. In this case trade does not result in automatic factor price equalisation due to the immobility of one factor. An important point to note is that for factor proportions models like the H-O model and the Specific Factors model, the distribution of the gains from trade need not accrue to everyone so that a Pareto optimal move requires lump-sum transfers.

In summary, traditional trade theory predicts a long run convergence of countries and regions. The role of policy in ever integrating economic entity is restrained to eliminating barriers to perfect labour mobility, both sectoral and regional. Two shortcomings of these theoretical approaches have been addressed in the more recent literature. Firstly, bi-lateral intra-industry trade is ruled out in traditional approaches, but this is important in practice as a substantial proportion of trade is intra-industry trade. Secondly, the traditional models are a-spatial, that is they ignore the importance of space and distance, which has an important bearing on trade flows in practice.

New trade and new economic geography models

More contemporary economic theory like the new trade theory, the new economic geography (NEG), or the new strand of theory on the role of foreign direct investment (FDI) provide justifications for the design of a broader regional policy aimed at various forms of market failures that give rise to persistent or even increasing regional differences in per capita income. The equalisation of factor prices does no longer turn out to be standard result. Producers can retain rents and free trade would, similarly to traditional reasoning, enhance welfare globally, but – and this is the new message – not necessarily for all participating countries (or regions, respectively).

New trade and new economic geography theories distinguish between immobile workers (farmers) and industrial workers who are either mobile sectorally (new trade theory) or both sectorally and regionally (NEG). The sensitivity of the NEG models to differences in trade/transportation costs explains different convergence patterns in the earlier and the later stages of integration[2]. Positive externalities associated with economies of scale and location advantages arising from easy access to large markets, skilled labour and technological knowledge may lead to growing polarisation of regions.

Neo-classical growth theory

Neo-classical growth theory also addresses the issue of regional growth and convergence. The Solow growth model (1956) with exogenous technological progress shows how diminishing returns on mobile capital result in all economies growing at the same "steady-state" rate in the long run where investment is just sufficient to maintain the existing capital stock. If countries have similar rates of technical progress, a lack of capital in under-developed regions or states implies higher returns in the short run. Thus, the model predicts convergence: the further a region is from its steady state, the faster it grows. Regional or cohesion policy facilitates convergence by raising the stock of public capital. This increases productivity of private capital, pushes out the steady state, and raises the growth rate (see, e.g. Arrow and Kurz, 1970).

Endogenous growth theory

If a definition of capital is extended to encompass not only physical capital, but also human capital (Lucas, 1988), public capital (Barro, 1990) and technology capital (Grossman, and Helpman, 1991), the returns are not necessarily diminishing, but

[2] See e.g. Fujita, Krugman and Venables, 1999 for an overview.

increasing. The endogenous growth models show how positive externalities associated with public good characteristics of investments can generate additional unintended benefits to the productive capacity of the economy[3]. In particular, that was incorporated into models as the accumulation of knowledge (e.g. Romer, 1986), or improvements in the quality of intermediate inputs (e.g. Aghion and Howitt, 1992, 1998). There the externalities arise when innovations that were generated in one firm are adopted elsewhere. Another line of research has concerned the level of social capital, that is institutions, government policies and interpersonal relationships that exist in a country (Zak and Knack, 2001, Hall and Jones, 1999). In this literature social capital affects the development of other types of capital. In contrast to neo-classical growth theory, the endogenous growth models do not predict automatic convergence.

Empirical literature

Both the new economic geography and endogenous growth literature suggest that in order to share the aggregate gains from integration across all countries (or regions) some policy measures may be necessary. Public intervention is usually defended on the grounds of either efficiency or equity. The first requires identification of market failures and modifications that arise out of spatial factors. The second type of justification is closely connected to the issue of factor mobility across regions, as well as to the wage rigidities on the local markets. Of course a policy intervention is only justified if the benefits outweigh the costs of these interventions.

NEG identifies two types of externalities – technological, or non-pecuniary, and pecuniary spillovers – as a source of potential market failures. Henderson et al. (1995) show how the technological spillovers can be spatially localised. Firms observe and imitate innovative technology of each other, which gives an incentive to locate closer together. Some empirical studies provide evidence for this argument (see e.g. Jaffe, Trajtenberg and Henderson (1993) on the localised use of patents). Also, "flocking together" may reduce transaction costs if different sectors interact vertically, thus reducing the cost of innovations (see Martin and Ottaviano, 1996).

Another type of market failures is associated with the lack of labour mobility. On the one hand, firms do not take into account welfare of the immobile agents when they choose where to locate. If no congestion appears, then full concentration would not create any problem if labour is perfectly mobile regionally. Another consideration along the same line is inter-sectoral labour immobility that may add to the welfare costs of spatial concentration when regions are specialised in specific industries. Blanchard et al. (1992) find that factor movements, and labour movements in particular, are central to the process of convergence in the US. In this respect it should be noted that labour mobility is very limited in some parts of Europe. For example German workers do not appear very mobile while Irish workers have similar propensity to relocate to their US counterparts. However, promoting mobility of labour could aggravate the negative impact of congestion. Also, it can induce further regional divergence, as active competitive labour would move to the agglomeration. Giannetti (2002) concludes that promoting labour

[3] For extensive reviews of the theoretical literature on endogenous growth see Hammond and Rodriguez-Clare, 1993.

mobility may lead to an increase in regional disparities[4]. This supports the argument by Matsuyama and Takahashi (1998) that immobility *per se* is not necessarily a market failure, but the absence of co-ordination between economic agents is. Venables (1996) shows how direct input-output linkages between firms and industries play a role equivalent to that of labour migration in endogenously determining the size of the market in different regions.

Finally, following the work of Hoteling's model of spatial economic competition, location can be a source of market failures as it reduces competition. Gabszewicz and Thisse (1986) and Scotchmar and Thisse (1992) show how regional policy may influence the nature of monopolistic competition through product differentiation. The normative choice that policymakers have to make is between the types of monopolistic competition.

Justifying the need for regional policy on the basis of equity considerations is complicated, since such a justification is dependent on the preference of policy makers and society at large with regard to different types of inequality. Again, this depends on the mobility of factors, the preference of inequality between regions or within rich and poor regions, as well as traditional re-distributive effects of fiscal policy.

Martin and Rogers (1995) construct an NEG model where transport costs are determined by domestic and international infrastructure and where capital and labour are distinguished. With infrastructure improvements funded through lump sum taxes, they evaluate the effect of improving infrastructure. If the reduction in demand due to the taxes is less than the increase in demand for local goods due to the reduction in transport costs as a result of the improvement of infrastructure, then firms will relocate to the home country if the domestic infrastructure is improved. An important result of the model is that, if international infrastructure is improved and domestic infrastructure is poor then firms will relocate to the other country, since they can supply the foreign market subject to low transport costs while being able to concentrate on the larger market that is subject to lower domestic transport costs. This result therefore predicts that improvements in international infrastructure would result in increased polarisation between countries since the country with the poorer domestic infrastructure looses industry. This prediction casts a doubt over the EU Structural Funds and particularly Trans-European Network (TENS) programmes, since especially the latter seeks to improve international transport links. On the other hand if infrastructure improvements are paid for by another country or body like the EU, the given that there are no income effects, financing of internal infrastructure has an unambiguous effect of drawing additional firms to that country.

The evidence on the prediction that domestic rather than international infrastructure should be promoted in order to foster convergence appears to point in the opposite direction. Countries like Ireland and to a lesser extent Spain and Greece, which have received large amounts of funding from the EU, a considerable amount of which has been

[4] Negative impact of labour mobility on convergence is discussed in Barry (1999, ch. 2). Also, indivisibilities in infrastructure may cause emigration to impact negatively on productivity (see O Grada, 1997). A recent paper by Morgenroth (2005) shows that out-migration has both positive and negative regional impacts in Ireland. On the one hand there has been divergence between regions but the high rate of out-migration has not restricted any region in achieving above EU average growth rates.

spent on the improvement of international infrastructure links, have converged. In the case of Ireland at least the convergence has to a great extent been due to foreign direct investment (FDI), which has located in Ireland despite a serious shortfall in domestic infrastructure (see Fitz Gerald, Kearney, Morgenroth and Smyth, 1999).

Finally, there can be a potential trade-off between equity and efficiency policy objectives. As shown in Williamson (1965) promoting national growth may require concentration of economic activity in the core region at the expense of lagging periphery. At the earlier stages of integration, inter-regional linkages, factor movements and central government policies are selective in favour of the centres, while this tendency is reversed as integration proceeds and the income levels become higher. It is surprising that this so called "Williamson Hypothesis" has been largely ignored by researchers except for the recent contributions by Hallet (1997, 2002). However, a number of NEG models directly address the trade-off between efficiency and income without reference to Williamson (see, for example, Martin, 1999). Some empirical evidence from the cohesion countries has supported the existence of the trade-off between equity and efficiency (e.g. De la Fuente, 1996 in a study of Spain, Morgenroth, 2002 in a study of Ireland).

The analysis of the market failures along the lines of NEG and new growth theory suggests a number of potential regional policy instruments. Due to the existence of spill-over effects and externalities certain types of public expenditure will not only have a short-run Keynesian effect but will also have a long-run supply side impact on the regions. Thus, regional convergence patterns may be affected by i) assistance to existing or new firms in the lagging regions; ii) public expenditure on physical infrastructure (roads, ports) that reduces transportation costs and promotes regional labour mobility; iii) public expenditure on human capital that stimulates inter-sectoral labour mobility. Overall, regional policy may stimulate increases in investment and/or labour, and can raise productivity by advancing technological development and/or improving opportunities for economies of scale.

The effect of infrastructure is typically incorporated as an additional input in the production function (e.g. Barro, 1990, Futagami et al., 1993). Because infrastructure is a public good, many producers can use it at the same time, giving rise to increasing returns to all factors when returns to private factors are constant. However, infrastructure can also impact on the productivity of all factors (Hulten and Schwab, 1991). Public infrastructure may also have an indirect and delayed effect on employment growth. Of course infrastructure investment should only be carried out if the return to this investment exceeds that of other investments. In this respect it is important to note that not all industries benefit to the same extent from such investments, so for example agriculture tends to benefit less from infrastructure (Pereira and Roca-Sagales, 2001). This suggests that infrastructure investment might induce a change in regional industrial structure. One of the implications of the spillovers of this type is the hub-and-spoke effect modelled, for example, in Puga and Venables (1997) and Vickerman et al. (1999). Design of policies

that would take into account these possible negative impacts is one of the biggest challenges for the Commission[5].

The role of human capital is an important field of research since human capital can be viewed as an essential prerequisite to the adoption of new technologies and the impact of globalisation. Human capital can be acquired through education, learning-by-doing or be passed on between generations. However, a crucial distinction has been made between human capital as an input for R&D purposes (see Aghion and Howitt, 1992) and human capital as a direct input in the production function (Lucas, 1988). The former approach implies that growth is driven by the stock of human capital whereas the latter implies that growth is driven by the process of accumulation of human capital (see Aghion and Howitt, 1998). The Lucas approach assumes that the marginal product of human capital remains positive regardless of the state of technology, which is unrealistic. On the other hand the Aghion and Howitt approach, that incorporates scale effects, suggests that large countries should grow faster since other things being equal large countries possess a larger stock of human capital, which is not supported by the data (see Jones, 1995, Cannon, 2000).

Of course if agglomeration economies exist, they can also affect the growth performance of regions. Martin and Ottaviano (2001) incorporate this type of mechanism into a growth model. They show that growth and agglomeration are mutually self-reinforcing. Thus, growth increases agglomeration and agglomeration increases growth. The model also shows that due to the continuous creation of new firms some firms re-locate to peripheral regions. Another contribution along these lines is that of Baldwin and Forslid (2000). They show that growth leads to agglomeration but that knowledge spillovers lead to dispersal of industry. In their model integration through a reduction in transactions costs for goods trade leads to increased concentration while integration that leads to a freer flow of ideas leads to dispersal. Another important finding of this model is that agglomeration not only maximises total growth globally but also raises growth for all regions, which reduces the negative impact of increased agglomeration.

Regional specialisation

Given that the key aspect of our project is the degree of regional specialisation it is particularly important to review the existing literature on the regional specialisation. While a number of studies on the degree of regional specialisation appeared since the 1960's the literature was given a particular impetus by the NEG literature, which of course predicts strong industrial relocation over time and therefore a high level of industrial concentration and specialisation. An important study was that of Ellison and Glaeser (1997) for the USA inspired many subsequent studies for EU regions.

In the case of European Union Member States, overall specialisation seems to have increased in the 1970s and 1980s, starting from a remarkably low level at the end of the 1960s as compared to US states (Hufbauer and Chilas 1974, Molle and Boeckhout 1995, Amiti 1997, Brülhart 1998, Walz 1999). Two recent studies on industrial location and

[5] Dallerba and Hewings (2003) review the equity-efficiency trade-offs vis-à-vis EU infrastructure development projects.

specialisation in the EU countries find an overall increase of specialisation and concentration of industries since 1980s, albeit at a very slow pace, as the result of quite divergent processes such as concentration of industries in some countries and dispersion of industries in others (Aiginger et al, 1999 and Midelfart-Knarvik et al, 2000). However, these results are based on country level comparisons and therefore ignore the regional dimension, which might hide more dramatic regional changes that are predicted by the NEG theory.

Regarding the regional specialisation, a number of studies on the localisation and concentration of industrial branches find an increase, in the 1970s and 1980s, whereas during the same period the industrial sector as a whole spread increasingly from the centres to the periphery enabling catching-up processes in the latter (Molle 1980, Hallet 2000). These investigations, however, cover only limited time horizons and a limited number of industrial branches.

In the case of accession countries, existing evidence based on trade statistics suggests that these countries tend to specialise in labour and resource - intensive sectors following an inter-industry trade pattern (Landesmann 1995). In spite of the dominance of inter-industry (Heckscher-Ohlin) type of trade, intra-industry trade has also increased, particularly for the Czech Republic and Hungary (Landesmann 1995, Dobrinsky 1995). Most of the research on regional issues in transition economies has focused on patterns of disparities with the aim to identifying policy needs at a regional level (for instance Spiridonova 1995, 1999 - for Bulgaria; Nemes-Nagy 1994, 1998 - for Hungary; Constantin 1997 - for Romania). Increasing core-periphery differences in Estonia are documented in Raagmaa (1996).

Project Research Results

In summarising the empirical findings we distinguish between the New Members States (NMS) and the EU –15. This distinction is important since on the one hand the EU-15 have been subject to a more gradual integration process over a longer period while on the other hand the NMS have had to adjust to the disintegration of the COMECOM and the resulting structural change as they moved towards market economics and the subsequent integration into the EU which is not complete.

Regional production structures in the EU-15

In the following section we consider the EU-15 countries, referring particularly to the countries that were chosen to be analysed in more detail as part of our study. These are Austria, France, Germany (East and West), Greece, Ireland Italy, Portugal and Spain. Overall, economic activity is very dispersed in the EU-15 countries and is closely related to the distribution of the population. This applies to broad economic sectors (agriculture, manufacturing, construction, services) as well as the majority of the industries within the manufacturing sector.

Considering the degree of *concentration of industries*, that is the degree to which particular industries are concentrated in particular locations, slightly higher degrees of

concentration prevailed in agriculture and related food-processing industries, which are of course more closely associated with more rural regions rather than urban agglomerations. Similarly resource-based industries such as mining and steel industries are more concentrated since natural resources are only found in certain locations. Finally, manufacturing industries, which are subject to localization economies are also more concentrated (e.g. Mining, Iron and Steel). By contrast, several of the manufacturing industries that are usually regarded as being subject to firm-specific increasing returns to scale are not found being systematically higher concentrated than other industries.

Considering the empirical evidence as a whole, there appears to be no strongly defined trend towards increased concentration or indeed de-concentration. There appears to be a slight tendency towards de-concentration among most industries, including agriculture and food processing as well as industries subject to firm-specific increasing returns to scale.

The degree of concentration depends on industry characteristics. Specifically, it is usual to classify industries into increasing returns to scale industries following the classification suggested by Praten (1988) and resource intensive industries according to the OECD classification (OECD, 1994). Thus, all industries were classified into three categories: *increasing returns*; *resource intensive*; and (remaining) *footloose*.

In general the *resource intensive industries* are most concentrated which is not surprising since they are dependent on resources, which are only available in some locations. On the other hand *footloose industries* are least concentrated which accords well with their status as footloose, since this status implies that they are not dependent on any localised factor and thus can locate almost anywhere. Interestingly, increasing returns to scale industries are not found to be particularly concentrated[6].

The degree of *specialisation*, that is the degree to which a region is dominated by specific industries is of more fundamental concern to this study than the degree of concentration. The evidence suggests that most regions in the EU-15 are sectorally diversified with respect to their portfolio of both broad economic sectors and industries within the manufacturing sector. This is true in particular for Austria, West Germany and France. However, on the one hand, core regions, such as Paris, Madrid, Vienna, Rome and Hamburg, and on the other hand, peripheral regions such as Algarve, Sicilia, Aegean Islands, Bretagne, Burgenland, the Irish Midlands and Schleswig-Holstein, tend to be somewhat more specialised.

Any changes in regional specialisation patterns during the analysed period occurred at a very slow pace. However, an important difference in trends arises from different types of specialization measures. The vast majority of regions showed some tendency towards higher specialization when referring to measures of *absolute* specialisation. By contrast, specialisation decreased slightly in most regions when applying a *relative* measure, no matter whether compared to a national or the European average as a benchmark. The regional specialisation decreased in particular after the accession of the respective

[6] Of course this may simply be due to the classification used. It is however, not trivial to construct and an alternative classification so this well known classification was utilised here.

countries to the EU. However these trends are not significant in a statistical sense, which is presumably due to the very gradual changes, which would only become significant when observed over a longer period. An exception to this is Ireland where the degree of specialisation for manufacturing industries experienced a significant decline (both absolute and relative), over the period 1972 to 2002.

Those regions that are located within countries that had a high level of specialisation tended to show a decrease in specialisation. More generally, the relationship between the initial specialisation level and subsequent change of specialisation was usually negative. This suggests convergence in terms of the broad level of specialisation across regions and thus a reduction of any core-periphery pattern in terms of industrial structure compared to the start of the period.

Clearly not all regions are the same and it is possible to group regions into some broad categories which allow a comparison across these categories. Regions are grouped together according to their industrial structure, resulting in five separate categories, which are found to share further characteristics in common, particularly regarding their geographic situation. Accordingly they can be earmarked as central; semi-central; highly industrialised; peripheral and semi-peripheral, regions, thus reflecting a core-periphery pattern based on a characteristic distance-related division of labour (see maps A2.1-A2.6 in Appendix 2).

Firstly, given the importance of a core-periphery pattern in the New Economic Geography literature, it is useful to consider *central regions*. These are particularly important in monocentric countries and these central regions tend to be more specialised in knowledge intensive industries. Secondly, regions proximate to these central regions (*semi-central*) may benefit from spillovers from the central regions so these are also identified. Apart from the central regions, which tend to contain accumulations of knowledge intensive industries, *highly industrialised regions* can often also be identified. These are usually focussed on manufacturing and, more particularly, on resource dependent industries, are usually situated at the borders towards Central Europe (France, Portugal, Spain, Italy).

On the other hand *peripheral regions* tend to have a more basic industry mix, focusing more on resource intensive industries, agriculture and footloose industries can also be identified. These are usually situated at the external EU borders. Of course some regions have an industry mix characteristic of both peripheral and highly industrial regions, and they may be referred to as *semi-peripheral*.

The gist of our findings is contained in Figure A2.7 (see Annex 2) that drafts a schematic interpretation of regional specialisation in EU-15: There seems to be a *core* of Central European countries with highly diversified regions. Within these countries, the degree of specialisation increases slightly towards their borders. Specialisation grows further at the more distant parts of EU-15 (particular in the Southern parts). In line with this, the industry mix changes from the diversified core, via core borders specialised on resource intensive or specific footloose industries, towards the (Southern) *peripheries* with a focus on agriculture and tourism-related services. The *urban centres* both in the core and in the

Southern peripheries seem to play a special role in this division of labour: As they provide in particular knowledge intensive services and (often) products from IRS industries to the economy, they seem to be more specialised than the average Central European region. Yet, they seem to be less specialised than the highly-specialised average Southern European region. From this, one could conclude that centres generally show a medium degree of specialisation wherever they are in EU-15.

Similar to the level of specialisation, the specific nature of specialisation usually changed at a very slow pace. A notable exception to this is East Germany where dramatic change occurred immediately after reunification. Of course, this is not surprising given the magnitude and suddenness of the policy shock. In most other cases, the regions in EU15 experienced a downsizing of their specific foci, and an upsizing of their underrepresented sectors (location coefficients approaching 1 from above and below). As a result of all these movements, the nature of regional specialization tended to converge towards an average state with less explicit foci. The convergence of regional specialization degrees in French, West and East German regions thus coincides with concentrated industries losing significance particularly at their specific locations (even services losing relative significance in regions with focus on these services). Only in most Spanish regions, is a specific specialization pattern observed where the industry foci of Spanish regions became more pronounced, with the exception of the central region Madrid. Accordingly, Spanish regions seemed to have become more directed towards their specific comparative advantages. At the same time, as Spanish regions also participated in the overall convergence trend of European regions regarding the degree of specialisation, the corresponding process of diversification must have taken place with respect to other, non-focus industries.

The main *trend over time* seems to be regions getting more diversified and converging with respect to their industrial structures, within countries as well as towards other European regions. For the former accession countries from the Southern European peripheries, this evolution of regions becoming more alike seems to have started after their accession to the EU.

Overall, this analysis does not yield evidence in favour of the New Economic Geography literature, since there is no dramatic specialisation trend, where trade leads to agglomeration of industries only close to main markets. However, the results discussed so far have not considered to what extent different industries and especially those that are subject to increasing returns to scale (IRS) are agglomerating.

Thus, while some *weak evidence of a core-periphery pattern* can be found with regard to the spatial dimension of the interregional division, there appears to be no clear evidence for the "catastrophic scenario" that is characteristic for many NEG models: No increasing specialization of core regions with foci on IRS industries (in the Pratten definition) and no increasing specialization of peripheral regions with underrepresented IRS industries was found. Also, no deepening of the core-periphery pattern in terms of specialisation could be observed.

Specialisation and economic performance in the EU-15

One of the key questions of this research project is what the *relationship between the degree of specialisation and regional performance* is, and this is the subject we turn to next. As was already alluded to in the introduction, the income and growth performance of the EU-15 regions differed markedly. To begin with, German and French regions realised higher income levels (German average: 25 000 €, French average: 23 740 €, Spanish average: 15 333 €, in 2000). Spanish regions achieved a higher real GDP growth in the 1990s with an annual growth rate of 3.0% as compared to German regions (incl. East Germany) with 1.3% and French regions 1.7%. Interestingly, for 2000 Ireland recorded a high per capita income of €27,000 but this high level is only a more recent achievement with high annual GDP growth rates of 9.4% over the 1990s. While all Irish regions grew very fast over the 1990's those that were already better off grew faster so that regional differences in the country increased. This stands in contrast to the Italian regions which on average grew relatively slowly, but where regional differences declined. It should be noted that for Italy the per capita GDP of the poorest region is still 35% below the national average in 2003 compared to 66% in 1970, but the big change has been among the richer regions. The richest region in Italy had a per capita GDP that exceeded the national average by 30% in 2003 while the richest region in 1970 was 75% ahead. Thus the gap between the richest and poorest region has declined from over 100% to 55%.

In terms of their *output performance*, the highly industrialized regions appear to be falling behind over the observation period of the 1980s and 1990s. Thus, they experience low growth and end up with below-average per-capita incomes. This is consistent with the view that the more traditional and often heavy industries have not been performing well. The central regions realised above-average income levels and grew fast in France and Spain, or at least medium in Germany and Ireland. The remote peripheral regions appear as catching-up regions; they tended to reveal medium to high growth rates but still realised only below-average income levels. For example in Ireland the peripheral regions grew by 5.9% annually in terms of GDP growth which is faster than the EU average, but slower than the Irish average at 8.6% annual growth, which has implied that while all Irish regions are converging to the EU average (and indeed some have surpassed it), the within country pattern is characterised by a process of divergence. Semi-peripheral and semi-central regions, however, behaved differently in the different countries: In the case of France, they showed no uniform growth or income characteristics. In the case of Spain, they appeared to develop less dynamically than other regions, and the two groups seemed separated by their different income levels (higher for semi-central regions, lower for semi-peripheral regions). By contrast, in the case of West Germany, they usually realized quite high growth rates during the 1980s and 1990s, and reached medium to high income levels. For East Germany, no comparable relations can be detected. For Ireland the semi central region and the semi peripheral regions with the exception of one, have performed above average. However, the best performing region was the one semi-central region, which benefited from significant spillovers from the central region (Dublin).

Since the degree of regional specialisation and regional industrial structures is defined on the basis of employment shares, one might expect an even stronger relationship between

employment performance and specialisation than that between specialisation and GDP. Nevertheless, the evidence on the link between employment performance and specialisation is rather mixed. Firstly, mirroring the results for output, a number of countries suffer from higher average unemployment rates. These include Spain and East Germany (> 10 percent) which stand in contrast to Portugal, Greece, France, West Germany, Italy, Austria and Ireland (< 10 percent). There was, however, not much difference regarding the ability of the countries to create new jobs (usually around +0.5 percent per year). Notable exceptions in this respect except are Portugal and Ireland (around +1.2 percent and around +1.7 percent). Moreover, within each country, there was also remarkable regional variance regarding the employment performance within countries.

With respect to the regional performance relative to country averages, there appears to be a negative relation between employment change and subsequent unemployment in the cases of Germany, Ireland and Spain (regions that had the worst employment decline suffer from the highest unemployment thereafter, and vice versa). The relationship between the performance and the region classes with their characteristic industry mixes is not very clear. Highly industrialized regions tended to experience substantive employment decrease and usually high unemployment (not in the case of France). Also, several peripheral regions experienced relatively high employment increases combined with relatively high unemployment – yet this does not apply to Spanish peripheral regions. For all other classes the evidence is rather mixed.

The weak relationship between the regional industrial structure and its employment performance is also confirmed by some correlation coefficients on the initial specialization of a region and its subsequent employment change. While the relationship is usually negative it is rarely significant in a statistical sense. An exception to this is the case of Irish regions where the correlation was positive for 1972 to 1990 and 2000 to 2003, even though it is negative for the crucial 'Celtic Tiger' period in the 1990's. Even less coincidence seems to exist between the change of regional specialization and the simultaneous employment change. Only for East German regions, was the probability for regional job losses significantly higher both the more specialized the respective region was, and the faster its specialization degree declined. Again for Irish regions an increase in specialisation was positively correlated with employment growth for all periods bar the 1990's.

High specialization of regions on specific industries (localization of certain industries in a region) does seem to influence the employment change of these very industries: A high regional localization seems to be highly and usually negatively correlated to the subsequent regional employment performance of the respective industry group which is consistent with the finding of a trend towards diversification away from the region's industry focus. Unsurprisingly this effect is most pronounced for regions with a high degree of specialisation in declining industries such as resource intensive industries. Significantly, this negative correlation also pertains to the high increasing returns to scale (IRS) industries, which contradicts the predictions of the New Economic Geography literature, which argues that agglomerations of IRS industries will grow so that all firms in these industries are eventually located in the agglomerations. Furthermore, a negative

correlation is observed for regions specialised on concentrated footloose industries. Overall, since the change in specialisation in particular industries and employment change in these industries is positively correlated, one can conclude that the reduction in the level of specialisation is due to a decline of these industries at a regional level.

Thus one can conclude that an initial high specialisation at the regional level had a negative impact on employment growth. This negative relation can be observed, in particular, in regions specialized in resource dependent and IRS industries. The significantly negative industry-specific specialization-growth nexus did, however, generally not translate into a negative aggregate specialization-growth nexus: There is little evidence from the descriptive analysis of a high initial specialization onto single industries, or a comparatively high aggregate specialization generally shaping aggregate regional employment growth to a notable extent.

Evidence for a *negative relationship between specialisation and economic performance* is provided by Morgenroth (2005b) for the Irish regions (NUTS 4 or counties). An econometric analysis of the Irish case using production functions for the manufacturing sector that were estimated at the NUTS 4 level, showed that regions with a higher level of specialisation (absolute and relative), ceteris paribus produce a lower level of output, even when other locational factors are accounted for. These results were statistically significant (for relative measures) and thus provide strong evidence against specialisation and in favour of diversification. Furthermore, some tentative evidences for the factors affecting specialisation are produced. Firstly, a higher share of foreign employment reduces specialisation. Secondly, trade openness increases specialisation. Finally, urbanisation increases absolute specialisation but decreases relative specialisation.

Of course specialisation might not only impact on the level or growth of output but may also have important impacts on the labour market. This relationship was studied by Longhi, Nijkamp and Traistaru (2005) for EU-15 regions over the period 1983 to 2001. In particular the paper considered the impact of specialisation on unemployment under different collective bargaining institutions. The results indicate that *more specialised regions suffer higher unemployment rates*, and that this *relationship is stronger in countries with less centralised bargaining systems*.

Evidence about a *negative effect of specialization on correlations of regional growth rates* with the Euro-zone is provided by Tondl and Traistaru (2005). High correlations of growth cycles are taken as an indication of a low probability of asymmetric shocks and thus a relatively low cost of monetary integration. Using a panel data of 208 EU-15 regions over the period 1989-2002 they estimate a system of four simultaneous equations to analyse the impact of regional trade integration, specialization and monetary policy co-ordination on correlations of regional growth cycles with the Euro area. They find that deeper regional trade integration with the Euro area is associated with increased regional specialization. While deeper regional integration has a direct strong positive effect on the correlation of regional growth rates with the euro area growth rate it also has a negative and significant indirect effect via increased specialization at the region level. However, the positive effect of trade integration offsets its negative effect via regional specialization.

Bode, Krieger-Boden and Soltwedel (2005) investigate the impact of *European integration on regional specialisation patterns* in an econometric study. Here the focus is particularly on institutional integration which is measured by an index which was first put forward by (Dorucci, Firpo, Fratzscher and Mongelli, 2002). This indicator is measured at the national level and it trends upwards with strong convergence among EU-15 countries regarding institutional integrations. A second variable which is interpreted as an indicator of globalisation is the ratio of world trade to world GDP. These variables are included in a panel regression that aims to explain the share of sectoral employment at the regional level. The respective share at the EU level is also included as an explanatory variable. The coefficient for this latter variable then measures the degree of beta convergence towards the average EU-15 industrial structure. The result suggest that industrial structure in the EU15 regions seem to follow a secular time trend towards convergence of industrial structures. For most industries the degree of regional specialisation is decreasing, confirming the descriptive results outlined above. Exceptions are mining and quarrying and food processing which are resource intensive and textiles and clothing which are more labour intensive.

Importantly, institutional integration is only found to have a significant effect on two industries. On the other hand the so-called 'globalisation' variable is found to increase specialisation, which is a similar finding to that of Morgenroth (2005b).

Regional production structures in the New Member States

Since the NMS have been subject to radical changes in their economic systems, moving from a centrally planned economy to a market economy and the associated trade re-orientation, it is particularly interesting to consider the trends of regional specialisation and sectoral concentration in the NMS. The NMS we focus on are Bulgaria, Czech Republic, Poland, Romania, Slovakia, Slovenia, and Hungary, which comprises a set of countries that are representative for all NMS. While neither Romania nor Bulgaria are member states of the EU, they are nevertheless included here among the set of NMS since their accession is expected in the short-run.

During the communist era with central planning economics the NMS had an industrial structure that was heavily focused on manufacturing which in turn was heavily concentrated, with industrial complexes spread around regionally. Furthermore, capital-intensive heavy industries were particularly dominant. Transition policies that were focused on privatization and deregulation were implemented in the manufacturing sector with the restructuring of the industrial base being the ultimate purpose. The transition process set in train an unprecedented change in the division of labour in NMS countries where manufacturing employment and output declined radically and even though the share of the services sector increased strongly, unemployment increased dramatically. Exceptions to this general rule are Hungary and Romania, where at the regional level mixed trends are observed concerning their shares in the secondary and the tertiary sector of production, respectively, and the regions of Bulgaria and Romania that experienced increases concerning their shares of the primary sector. Overall, using trade activity with the EU-15 as a measure, there is evidence of strong integration at the national and regional level as trade integration is either high or increasing strongly.

In the *Czech Republic* both absolute and relative concentration declined but the decline in absolute concentration being very modest. The sectors that were found to be most concentrated in 1993 were financial intermediation, real estate renting and business activities and other community, social and personal services. In general the rankings of the various sectors remained roughly stable regarding both absolute and relative concentration. The only exception is the hotels and restaurants sector which while having an average level of concentration in 1993, experienced a significant decline of concentration so that in terms of ranking this sector went from being the fourth highest to the third lowest.

High concentration for all sectors was found in *Poland*, and these stayed constant for most sectors. Increasing absolute concentration was found for Agriculture, forestry and fishing, Transport Storage and Communications and Financial Intermediation. Real Estate Renting and other Business Activities was the only sector to have decreased in concentration. With regard to relative concentration increasing indices are found for 6 of 11 sectors. The only sector to have a declining index of relative concentration were Public Administration and Real Estate and Renting.

In *Hungary* absolute specialisation decreased for most sectors while relative concentration increased. Notable is particular the reduction of concentration of the machinery sector which spread throughout the country. A interesting result is that there is a negative correlation between absolute concentration and industry level growth.

For *Bulgaria* low levels of absolute concentration were found for 1990 but there was a slight increase until 2001. As might be expected the highest absolute concentration was found for the energy sector. The most striking finding was the significant increase of the index of absolute specialisation for the Transport Equipment sector where the Herfindahl index increased from 0.08 to 0.17. Relative concentration increased slightly over the period. Again a significant increase was found for the Transport Equipment sector but a similar increase is also found for the Basic Metals sector. On the other hand the Rubber and Plastic sector experienced a significant decline in relative concentration

The results for *Romania* also indicate low absolute concentration, which remained constant over time. High levels of concentration were found for Leather and Paper industries and a low concentration was found for in Food, Textiles and Wood. A slight increase of relative concentration was observed wit the highest index being that of Machinery and Electrical and Optical Equipment.

For the *Slovak Republic* the analysis was limited by the fact that just four regions could be distinguished. In general the level of concentration was found to be low with little change except the increase of the energy sector, which was concentrated more in Western Slovakia.

In the *Czech Republic* absolute and relative specialisation declined slightly. With regard to absolute specialisation no convergence of specialisation levels is seen, but for relative specialisation slight increase in differences occurred between 1993 and 2001. Prague has the lowest absolute level of specialisation but the highest level of relative specialisation,

reflecting the importance of the heavy industries, agriculture and services in determining the patterns of specialisation. Absolute specialisation increased in 4 regions bordering Germany and Austria.

Bulgaria was characterised by increasing absolute specialisation with divergence between regions. An exception is the most developed South West of the country where specialisation did not increase. Relative specialisation increased over time and again this was subject to diverging trends among the regions. Among THE regions that have a high level of relative specialisation two types can be identified. On the one hand there are those regions that have at least one very strongly performing industry and thus good overall economic performance while on the other hand some poorly performing regions also have a high level of specialisation. The latter also tend to be regions, which have failed to attract FDI.

In *Hungary* absolute specialisation increased in 14 out of 20 regions. Of the six that either had a constant or decreasing level of absolute specialisation four are located in the south of the country, the others being the capital city region and one western region. In contrast, relative specialisation decreased in three quarters of the regions. These changes were particularly driven by the fact that machinery became a more important sector while food declined in importance.

Overall absolute specialisation levels have not changed substantial, which might be due to the slow modernisation in agriculture, the slow pace of privatisation and the reluctance of government to restructure heavy industries. The highest specialisation levels are found in the eastern more rural regions and the capital region. Relative specialisation varies substantially between regions but there has been little change over time in the indices. Again the eastern regions have the highest level of relative specialisation.

Absolute regional specialisation increased marginally in *Slovakia* over the period 1995 to 1999 and the regions appear to be converging in the degree of specialisation. However, there was a marked increase in absolute specialisation between 1999 and 2000, with increasing differences between the regions. This is particularly true for the Bratislava region. Relative specialisation also increases slightly over time. Again Bratislava has the highest level of relative specialisation.

A low average absolute specialisation level was found for *Romania* with no pronounced spatial pattern apparent. Nevertheless, less highly specialised regions included the capital city regions and more western regions plus one region on the Black Sea coast. In the most highly specialised regions one manufacturing branch typically accounted for 40% or more of employment. There has been a statistically significant increase in absolute specialisation over the period 1992 to 2001, but this was not uniform over all years, rather in some years the index increased while it decreased in other suggesting that individual events regarding the main employers might be the driving force for the changes. Overall 31 of the 41 regions experienced an increase in absolute specialisation. The 10 regions that experienced a decline in specialisation are to be found grouped in the West, the Centre and the North of the country. In general specialisation levels have been diverging. High relative specialisation was found in South-East, South-West and South.

In general relative specialisation increased, but the differences in the degree of regional specialisation declined so that the indices were converging.

An interesting consideration is to what degree the changes in the NMS have resulted in the industrial structure of these countries becoming closer to that of the EU-15. This was examined using an *index of dissimilarity*. This analysis showed that the industrial structure of Hungary and Bulgaria is diverging from the EU-15 structure, while that of Slovenia is converging to the EU-15 structure. No clear trend is obvious for Romania, which seems to be keeping a constant level of dissimilarity relative to the EU-15. Thus, one can conclude that with the exception of Slovenia, the structural change due to integration has forced the countries to specialise in sectors in which their new trading partners in the EU 15 were not specialised.

This analysis has found *support for the agglomeration effects* of the New Economic Geography models since internal regions (those that do not border other countries) and the capital city attract the majority of economic activities. Furthermore, capital-intensive sectors are only concentrated in capital cities, internal regions (those not bordering other countries) and regions that border the EU-15. As a general rule among the manufacturing industries the regions of the NMS tend to be more specialised in labour intensive activities, which reflects comparative advantage since labour costs are considerably lower in NMS. These patterns are also apparent in a dynamic analysis of the specialisation patterns.

Specialisation and economic performance in the New Member States

Integration is closely related to the levels of per capita GDP (see Diagram A2.8 in Annex 4) and thus, those regions that are more integrated into the EU have a level of per capita GDP that is closer to the EU-15 average than those that are less integrated. The same is also true for those regions that are closer to the EU-15. Those regions that were most able to maintain their share of manufacturing employment relative to other sectors also had a higher per capita GDP than those that lost a significant proportion of their manufacturing sector. This of course may well be due to the fact that they had a more competitive manufacturing sector to start with. On the other hand a high share in the services sector is also associated with high levels of GDP. This implies that regions with a high reliance on the primary sector do not tend to perform well economically.

It is also important to consider how the *regional inequalities* within the NMS have changed over time. The time span over which these comparisons are possible are short but given the nature of the transition process this is nevertheless a useful exercise. Indeed the analysis shows that the degree of regional differences in terms of per capita GDP have changed strongly in most countries between 1995 and 2000, in that the inequalities have increased in all but one of the countries, namely Bulgaria[7]. Thus, the transition process has led to increased disparities within the NMS.

[7] The countries are Bulgaria, Czech Republic, Latvia, Lithuania, Hungary, Poland, Romania, and Slovakia but some evidence is also available fro Estonia and Slovenia.

The *growing dissimilarity* between the industrial structure of the NMS and the average EU-15 that was highlighted above might also be reflected in the evolution of income and output measures. The analysis of this relationship reveals that more diversified regions have a higher per capita GDP than those that are more specialised. Those that least changed their structure also have the highest per capita GDP (see Diagrams A2.9-A2.12 in Annex 2).

Iara and Traistaru (2003) conducted an econometric analysis to investigate the convergence/divergence of Hungarian regions, which included a number of important correlates including the change in specialisation. This revealed that among Hungarian regions for the period 1994 to 2000 was characterised by divergence, confirming the descriptive analysis outlined above. These results also showed that *increasing specialisation appears to be associated with higher growth rates*, which appears to stand in contrast the econometric findings outlined so far suggesting that the Hungarian case might not be representative

FDI, industrial location and regional development

Foreign direct Investment (FDI) has been an important source of employment and growth in a number of countries. For example, it is well known that FDI contributed significantly to the recent growth miracle in Ireland. Consequently, many of the NMS have sought to attract FDI in order to support the privatisation of existing industries or to develop new ones. The role of FDI in the transition process cannot be underestimated since FDI is a source of capital, advanced management techniques, new organisation forms, skills and new technologies. FDI inflows, if sufficiently large and spatially differentiated, can have a significant impact not only on aggregate growth but also on the regional distribution of industries. Thus, an important part of our study was to investigate the spatial distribution of FDI and the impact of this distribution on economic activity.

FDI is spread widely in geographical terms but some concentrations emerge at the country and region level. In general FDI is most heavily concentrated in Hungary and Czech R., while Poland, Romania and Bulgaria still lag behind. From a sectoral perspective, it is noticeable that high-tech foreign firms are less numerous than low tech ones, representing no more than 30% of the whole sample. An interesting feature of the sectoral distribution of firms across space is that high-tech foreign firms prefer to locate in Hungary or Czech R., while low tech foreign firms concentrate are particularly concentrated in Romania (see Maps A2.13 and A2.14 in Annex 2).

Within each country except Bulgaria, some regions emerge as favourite location for foreign firms. These include the capital districts, the three North-Western Hungarian regions lying between Budapest and the Austrian border; the North-Western part of Romania, and particularly some western regions in Poland. These patterns have changed over time. While at the beginning of the period several Polish regions had concentrations of FDI of at least one standard deviation above the average, in 2001 only three regions maintain this concentration. The opposite trend characterized Romania regions. Thus, it is reasonable to conclude that Poland has at least partially lost its initial advantage in FDI attractiveness in favour of Romania.

Given these results it is also important to consider the location factors, which attract FDI. The economic factors that are important in attracting FDI are good macro-economic fundamentals, good infrastructures, skilled labour force, large domestic markets and a sound legal system. An econometric study was conducted as part of this project (Pusterla and Resmini, 2005) used a nested logit model to analyse the location choice of about 4,000 MNEs in Bulgaria, Hungary, Romania and Poland. This study confirms, firstly the predominant role played by economic factors and, secondly, that the relative importance of the economic factors as determinants of FDI differ according to the industry. In particular, high tech foreign firms seem to be attracted by market potential,[8] degree of connectivity with neighbouring markets, and agglomeration economies emanating from other foreign firms[9]. Low-tech foreign firms, instead, look for a more complex set of location advantages. Apart from those mentioned in the case of high-tech foreign firms, it also includes the cost and the availability of skilled labour force and the possibility of interacting with domestic firms. Quite surprisingly, country risk does not decrease the probability of a location to be chosen by a MNE. This confirms that markets compensate high risks with high profits.

The most innovative result of this study, however, refers to how foreign firm choose the final location within a large set of possible alternatives.[10] What emerges is that national boundaries do not exert any effect on FDI location patterns. The choice of foreign firms is not between Poland and Romania, for examples, but between groups of similar regions. High tech and low-tech foreign firms perceive this "similarity" differently. The former, in choosing a location for their production plants, consider three different types of regions: the capital cities, the regions bordering with the EU, and all other regions; the latter, instead, simply consider whether a region is member of the EU or not.

From a policy perspective this result is extremely important since it indicates that competition for attracting FDI occurs among regions rather than countries. Therefore, each region should be aware of which are its more direct competitors before implemented any policy for promoting FDI.

The issue of the potential benefits emanating from FDI is still a topical question. The theory does not seem to doubt about their existence (Blomstrom and Kokko, 1997; Alfaro and Rodriguez-Clare, while empirical evidence is inconclusive. As the International Trade Theory has recently demonstrated, the reduction in trade costs globally defined, together with the presence of increasing returns to scale, may force firms to move towards locations, which are as close as possible with source and final market. Consequently, movements of firms generated by trade integration may overlap or go in the opposite direction of those generated by FDI.

[8] Market potential refers to the market that a firm may serve by choosing a specific location. Therefore, it takes into account the size of the local market, as well as that of the neighbouring markets weighted by the distance from the location. The higher the distance, the lower is the market potential (Harris, 1954).

[9] Agglomeration economies concern all benefits firms enjoy from geographical proximity with other upstream or downstream firms (Fujita and Thisse, 2002).

[10] The analysis has been carried out at NUTS II level regions. Therefore, MNEs can hypothetically choose among 37 different locations.

Resmini (2004) demonstrates that the spatial distribution of manufacturing activity has changed during the 1990s in Bulgaria, Estonia, Hungary and Romania. In particular, Hungary shows a dramatic expansion in scale intensive and engineering sectors, while Estonia has further reinforced its specialization in labour intensive productions. Also Bulgaria and Romania show a slight change toward a specialization in more labour intensive productions. Within countries, patterns of industry re-location are quite apparent in Hungary, Estonia and, to a lesser extent, in Bulgaria, while Romania shows a spatial distribution of manufacturing activity more stable over time. Generally speaking, labour intensive productions tend to concentrate in border regions, while internal regions show a clear specialization in high and medium-high tech sectors. It is worth noticing that this trend, common to all the considered countries, is changing in Hungary, where regions bordering with the EU have been changing their specialization in favour to scale intensive and high tech manufacturing sectors.

Concerning the determinants of these patterns of relocation, the author demonstrates that the integration process with the EU has been the main cause. Both trade and production (via FDI) integration have positively affected the above mentioned changes, though with a different intensity across regions and sectors, but not over time. In particular, industry location patterns in Eastern regions, especially those which will be the external borders of the enlarged EU, do not seem to have been affected by trade integration, though sensitive to the presence of FDI. Consistently with the theory, the manufacturing sectors that are more likely to relocate are those characterised by increasing returns to scale, such as chemicals, transport equipment and motor vehicles. Finally, the lack of variation in the magnitude of these phenomena over time indicates that the deepening of the integration process within the EU has only marginally affected the economic integration process between Eastern and Western Europe.

Guagliano and Riela (2005) concentrate on the role played by Special Economic Zones (SEZs) and Industrial Parks (IPs) in attracting FDI by comparing the experience of the three more advanced countries, i.e. Czech R., Hungary and Poland. They found evidence of a positive relationship between number of SEZs and IPs at regional level and FDI flows and stocks. This result is partly due to the fact that most of SEZs have been established following the MNEs location decisions; ex-ante planning by national and regional authorities has become a consistent policy by late 1990s only. However, this positive effect vanishes in case of R&D foreign firms, the main reason being the fact that most of SEZs provide to foreign firms business facilities rather than acting as technological incubators.

Country studies provide useful insights on the development of FDI promotion policies and incentives in each of the targeted countries. What emerges is a wide diversification, in terms of timing, scope and level of governance (local versus national) in the considered countries.

Hungary has a long experience in pro-active FDI promotion strategies, whose contents and objectives have been changed over time, as demonstrated by Szalavetz (2004). In the first phase of the transition Hungary's investment promotion policy aimed at encouraging FDI inflows without trying to channel these inflows somehow. The main instrument was

tax exemption, and it did not pursue any regional objective, but only sectoral features. Export-oriented, efficiency-seeking FDI in the machinery industry especially in technology-intensive branches was considered to be better than market-oriented one, but all kind of FDI was welcomed. In fact, governments were lacking the necessary budgetary means that would have permitted them to channel investors to less developed regions by utilizing sophisticated promotion instruments. In other words, decision-makers adopted a passive liberal policy stance by letting country's modernization to be driven by FDI.

FDI promotion policy became more active after 1996, with the creation of the first regional institutions and the adoption of promotion instruments with regional relevance, such as industrial free trade zones (FTZs) and industrial parks (IPs). It entered in its third and actual phase in 1998, when it started to consider regional, structural and sectoral objectives in a more complex manner. This leads to the introduction of other important strategic objectives, such as the creation of networks (infrastructure and linkage development), entrepreneurship (SME development, employment creation, supplier networks, strategic business services) as well as the strengthening of regional endowments (in terms of institutions, social capital, education, training facilities, innovation parks, e-economy, and cluster development). This last transformation made Hungarian FDI promotion policy quite similar to that actually implemented by industrialized European countries.

Differently from Hungary, *Poland*'s FDI promotion policy has been regional oriented since the beginning (Wisniewski, 2004). However, it came into force later than in other CEECs. Generally speaking, it is based on two pillars. First of all it grants fiscal incentives to investments aiming at positively contributing to some national economic objectives, such as job creation or enhancing technological development. These grants, however, vary from region to region, and in the eastern and less developed voivodships are higher than in Warsaw or Poznan.

The second pillar of Polish promotion policy is the development of the Special Economic Zones (SEZ). The Law on SEZs entered into force in 1994 with the aim of accelerating economic development of selected regions by offering geographically targeted fiscal incentives to investing firms. This act represents the most important policy instrument for creating regional initiatives in relation to FDI. It is coherent with the bottom-up initiative which characterized the whole Polish transition process.

Regions identified as impact regions under the SEZ Act may – through their own initiative and administrative capabilities – set up special zones for creating new enterprises. The SEZs are therefore aimed at attracting greenfield investments, creating tax holidays in up to fifteen years and job creation grants under certain conditions of investment size and durability of jobs created.

Although the law specifies a wide range of objectives to be achieved with SEZs, ranging from economic development, export promotion, introduction of new technologies, or infrastructural upgrading, they have been created to help industrial regions to withstand the social and labour market effects of industrial restructuring.

So far, SEZs have been created in 11 of 16 Polish regions. According to the latest available data (2002), SEZs, as a whole, have attracted 677 projects, which account for 3.9 billions PLN (over 1 billion euro) of total investments and 47 thousand of new jobs. 25% of these projects are greenfield investments undertaken in manufacturing sectors. However, altogether the SEZs attracted only 3.5% of total foreign capital invested in Poland. Therefore, they do not seem to have been particularly successful, though individual regional successful stories can be identified (Lodz and Slask).

Since SEZs have not produced the expected results, either in equalising regional development with the help of foreign investment or in multiplying capital inflow to the country, the application of new instruments aiming at other than employment objectives are now on the agenda in Poland. The most important of these new instruments are technological parks, so far not existing on a large scale in Poland.

Czech Republic implemented an investment incentive scheme quite similar to that implemented in other OECD country in 1998. It aimed at encouraging large capital intensive foreign firms to invest in manufacturing sectors and focused on job creation. The amount of the incentives granted to foreign firms differed across regions and it was positively related to the unemployment rate. In the early 2000s it was expanded to business support services and technology centres. Moreover, changes were introduced in order to accommodate the needs of medium-sized foreign investors. If one compare the objectives of these pro-active policies with the results obtained, in terms of high concentration of foreign firms operating in medium-high and high-tech sectors, it is possible to conclude that the program has surely been effective, at least from a sectoral point of view. Thorough econometric analyses, however, do not confirm this positive relationship (Guagliano and Riela, 2005; Kippenberg, 2005). Therefore, further analysis is needed before coming to a definite answer.

Romania, had to make impressive efforts to improve the economic fundamentals, the legal framework and the business environment (Pirciog, 2004). Consequently, most of the transition phase has been characterized by passive open door policies towards FDI: Most of the regulatory changes, however, came into force in the early 2000s, only. They were accompanied by other FDI supporting policies, aiming at further encouraging foreign investments. To this purpose, the most important policy instruments that national and regional governments can adopt are fiscal incentives and the establishment of industrial parks, which can be set up on the initiative of either public or private institutions at local level. Special incentives have also been envisaged for foreign firms investing in less developed regions. Although it is too early even for a preliminary evaluation, the positive trend shown by FDI in these recent years indicates that the country is on the right way to successfully complete its transition and catching up other countries of the regions.

Bulgaria is even more far behind than Romania, being still engaged in the creation of an economic, business and legal environment conducive for FDI. No pro-active policies seem to have been implemented up to now, and the few foreign investments undertaken in the country are the result of sporadic opportunities rather than of a planned strategy. Major difficulties in investing in Bulgaria rely on the instability of the whole Balkan region, and in the uncertainty which still characterizes the legal framework. The

weakness of the most important economic factors as well as the lack of any pro-active measure to promote FDI has been evaluated as the main responsible for the low attractiveness of the country for foreign firms (Totev, 2005).

Policy Environment in the EU-15

The developments of the industrial structure do of course not occur in a policy vacuum. At the regional, national and EU level, a variety of policies have been pursued that have a direct or indirect effect on structural change and regional income and thus have an impact on cohesion. It is therefore important to consider what policies have been in place and what their impact has been. The latter is of course a difficult task since this project was not concerned with the evaluation of policy, and thus we have to draw on the available literature to determine the effect of policies.

General policy orientation

Firstly it is useful to consider the general economic policies that have driven the development of the countries under investigation. *West Germany*, has been subject to a relatively non-interventionist regime since the Second World War. West Germany fully embraced free trade which given the relatively high productivity in the past resulted in high export volumes and thus greater prosperity than would otherwise have been the case. Following the oil price crisis in the early 1970's a somewhat more interventionist approach was taken which however was rolled back somewhat in the 1980's. Nevertheless, some sectors have continued to be supported such as the heavy subsidisation of the coal mining industry.

On the other hand, *East Germany* was part of the COMECOM and was isolated from West Germany until the fall of the Iron Curtain (and the Berlin Wall) in 1989. It thus was subject to non-market plan-economics where supply and thus production was centrally determined. Following reunification the West German market driven system was introduced to East Germany. As this change took place all at once, the regions of East Germany were subjected to a sudden policy shock. The resulting restructuring through privatisation and widespread plant closures was supported by substantial financial transfers from West Germany. Thus, the two parts of Germany have had a completely different historical policy background, which of course has an influence on the patterns of industrial specialisation that is seen today.

In *France* there has traditionally been a tendency to enact policies that were aimed at reducing uncertainty mainly through the production of plans (*planification*). Thus, firms and other agents received ex-ante information, which allowed them to plan ahead. Nevertheless, France has been a open economy with substantial trade flows and integration into the wider world-economy. On the other hand *Greece*, *Portugal*, and *Spain* had a somewhat different economic history mainly due to the political situation in these countries as these countries were subject to dictatorships. In the case of Portugal and Spain the Salazar and Franco regimes aimed at increasing the degree of industrialisation as the two countries were largely agricultural at the end of WW II. At the same time as they pursued industrial promotion policies they followed the infant

industry-protectionist policies that were common in post-War Europe. These protectionist policies were also followed in *Ireland* until the late 1950's. Following a prolonged period of relative economic isolation Ireland opened up its trade to international competition during the 1960s and became a member of the European Economic Community (EEC) in 1973. This meant that the indigenous firms that grew up under the protection of tariff barriers were exposed to international competition.

Structural policies

West German industrial policy traditionally focuses on subsidies for private enterprises rather then on public ownership as main instruments. Nevertheless, the State does hold substantial shares in a number of major publicly quoted companies such as Volkswagen. The focus of the subsidies was concentrated on traditional sectors like coal mining, agriculture and construction. The federal political structure of the country has always ensured that regional policy has been important. At the heart of this is a scheme of fiscal equalisation between the federal states, which seeks to eliminate the fiscal effects of any disparities across federal states. Furthermore, an investment grant scheme for lagging regions exists, where support is granted both to infrastructure projects of communities as well as to investment projects of private enterprises, usually from the manufacturing sector. While these policies are mainly aimed at lagging regions, old industrial areas with major restructuring problems and high unemployment also benefit from this policy.

In contrast, the socialist *East German* government used to direct the investments for its state-owned enterprises. There was a specific focus on heavy industries, as these were regarded as key industries for industrial countries. Rather than allowing a range of companies to grow up production was concentrated in large vertical combines. Compared to West Germany, production of consumer goods was neglected. On the spatial level, this policy focused on locating at least one industrial complex in every region including the most remote ones. Thus, their location was not chosen by underlying economic forces, but rather the location was determined by technocrats. At least from the early 1980's onwards it became obvious that development was stifled by under-investment.

All in all, both West German and East German structural policies thus acted towards the maintenance of a high share of manufacturing industry in the economy, and towards a high degree of regional homogeneity within each respective country, and this influenced the industrial and regional structure of the country. Nevertheless, after the transition shock of the reunification, the industrial base in East Germany eroded dramatically, and enormous difference between the West and the East part of the enlarged Germany became evident.

In *France*, *Portugal* and *Spain*, the industrial policies focused more on state-owned enterprises (SOEs). In all three countries many large industrial enterprises were state owned. Portugal started socialist nationalisations after the revolution of 1974. Spain, after 1976, transformed the Franco-created state-owned holding company INI (Instituto National de Industria) into an "enterprise hospital" that acquired several large private firms in trouble. France in 1982 experienced a number of nationalisations after the socialist party came into power. However, these policies were reversed in the 1990s, as

all three countries embarked on a policy of privatising state owned enterprises. The aim here was to save these firms in the short-run and to restructure and modernise them in order to make them more competitive, which was successful in at least some cases. Nevertheless, there is still a higher willingness of governments in these countries to intervene and bail out firms that are in trouble. However, given the relatively strict EU rules regarding State Aid, opportunities to bail out firms have diminished substantially.

More generally, subsidies in these countries tended to be directed towards: (i) industries that used to be regarded as being important for a strong and self-sufficient economy, and that are now ailing, like agriculture, iron and steel and shipbuilding, and (ii) industries regarded as being modern and growth-promoting like aeronautics, nuclear industries and telecommunications. Also, subsidies tended to favour large firms. Regarding regional policies, the three countries used a range of policy instruments at hand (regional incentive schemes, SOEs, indicative planning, installation and support of high-technology parks) with the main objective of trying to decentralize the economy.

In *Ireland*, industrialisation was initiated by the State in the 1930s' through the foundation of major state owned companies including major utility companies such as the Electricity Supply Board. During the period up to the late 1950's infant industries that were aimed at supplying local demand, were protected through tariffs and quotas. As this was replaced by a more open trade policy, support for industries has slowly declined, but even today certain sectors can avail of subsidies e.g. the tourism sector, which of course is more important in more remote areas. However, the general thrust of industrial policy has shifted progressively towards more high-tech sectors and particularly the IT and chemicals and pharmaceuticals sectors.

Post war Irish regional policy started with the Underdeveloped Areas Act in 1952. This act remained in place until 1969 but towards the end of the 1950's the regional dimension of act was increasingly neglected in favour of national growth and subsequent acts reinforced by the Industrial Grants Acts of 1956 and 1959. These acts reduced the grant differential between the designated regions and the rest of the country. Implicitly this assumed that there is a trade-off between national growth and regional convergence.

During the 1960's the idea of growth centres was promoted although no specific policies to promote growth centres were enacted. However, this was largely superseded by the Regional Industrial Plans, which were published by the Industrial Development Agency (IDA) in 1972. These were aimed at dispersing industrial development rather than concentrating it in a few growth centres. In general the IDA managed to generate substantial numbers of manufacturing jobs. During the 1980's regional issues lost in importance as unemployment soared. Thus, job creation at any location was required. Throughout, the policies of the IDA were pursued through industrial grants, which were available on investment. More recently these grants were subject to strict job creation targets and indeed some companies had to pay back grants if these targets were not achieved. Of course a favourable corporate tax regime in the form of low rates was available to exporting firms from the 1950's and this had to be extended to all firms under EU regulation.

The EU Structural Funds also played an important role in regional development from 1989 when the Structural Funds were expanded substantially in order to compensate the weaker countries for the potential losses from the Single European market, and subsequently through the introduction of the Cohesion Fund which aimed at preparing the poorer countries for Monetary Union. In Ireland a relatively higher share of the Structural Funds were used for training and other labour market measures than in the other main beneficiary countries of the Objective 1 Structural Funds. While this was prudent given the level of unemployment at the time, a large infrastructure deficit remains.

In *Greece* regional policy was also aimed at enhancing the industrial activity at the regional level. This policy was implemented through subsidies and tax exemptions at the firm level, and through more general public investment, which has also been aided by the EU through the Structural Funds. In general it appears that the policy had some success in attracting investment into the regions, even though this was typically in labour intensive industries. More recently the focus has shifted towards start-up firms.

All EU-15 countries under observation intervene in the process of regional structural change, mainly by industrial policies, and therefore mainly aimed at large, ailing industries in highly industrialized regions. Support for growth-intensive industries with new technologies was usually less important. Regional policies were mainly aimed at lagging regions, thus trying to counterbalance at least partially the rather centripetal stance of the industrial policies.

EU Regional and Cohesion Policy

Apart from national policies, the EU has also pursued various policies which have important implications for both regional development and regional specialisation. Principally, the Structural Funds have been targeted at the lagging regions and those undergoing structural change. Furthermore, in the run-up to EU membership the accession countries were eligible to pre-accession Structural Funds. While these instruments constitute direct regional policy, it is obvious that the integration process itself, which has also been driven by the introduction of the Single Market and the Euro.

Structural Funds

The principal regional policy instrument at the EU level are the Structural Funds which play a crucial role in improving the social and economic cohesion of the EU. Rather than simply transferring resources in an untied manner, the Structural Funds have to be spent on certain types of activities and according to the principles of concentration, partnership, additionality and programming. The general aim of the Structural Funds is to improve the economic structure of the regions that receive funding through the development of infrastructure, the improvement of human resources through education and investment in the productive sector. For the period 2000-2006 the EU is making available a total of €213 billion.

Structural Funds as the name suggests is made up of a number of different funds. These are:

- European Social Fund (ESF) encompasses support for active labour market policy, specifically training and recruitment aid in order to re-integrate the long-term unemployed back into the workforce.

- European Regional Development Fund (ERDF) is concerned with basic infrastructure, also with education and healthcare infrastructure projects, job creating investments and aid for small firms.

- European Agriculture Guarantee and Guidance Fund (EAGGF-Guidance), is concerned with rural development measures and aid to the farming sector. These two aspects are particularly concentrated on the so-called disadvantaged areas. The EAGGF is closely linked to the Common Agricultural Policy of the EU.

- Financial Instrument for Fishery Guidance (FIFG) is specifically aimed at modernising fishing fleets.

Separate from the Structural Funds is the Cohesion Fund. This fund was set up in 1993 in order to help Greece, Portugal, Ireland and Spain in their preparations for the Single Currency by further improving the economic environmental infrastructure in these countries and thereby strengthening their economic structure. For the period from 2000 to 2006, the annual budget of the Cohesion Fund will amount to €2.5 billion, or €18 billion over seven years.

In addition to Structural funds there is Trans-European network programme, which is designed to improve transport links throughout Europe by improving designated transport routes. Furthermore, the EU has become involved in spatial planning through the formulation on the European Spatial Development Perspective.

Pre-accession Structural Funds

While the applicant countries are not yet members of the EU, the EU Commission has recognised the need to also help these countries, especially as the process of preparation for EU membership imposes costs on these countries. As a consequence the EU has put in place the so-called Pre-accession Structural Funds to help the applicant countries (Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Romania, Bulgaria) prepare for the accession. These include the following measures:

Pre-accession Structural Instrument (ISPA) has been in place since January 2000. It comprises a co-financing of big-scale (min. €5mln) investment projects in the transport and environment sectors. EU covers up to 75% of the cost of projects that are submitted by the national governments or the private sector. Overall there is a budget of €7 billion over the period (€1 billion per year).

PHARE is aimed at financing reforms in economic development, administration, social change and legislative work. This is expected to help the candidate countries meet the criteria for membership of the EU particularly in the area of institution building. The programme that was started in 1989 will end when candidate countries (except Malta, Cyprus, Turkey) have become EU members. The financing is 100%.

SAPARD is the community support for pre-accession measures for agriculture and rural development in the applicant countries of Central and Eastern Europe in the pre-accession period. A new programme was initiated early in 2000, and will run until 2006. EU co-finances up to 50% of the total costs of the profit-making projects and up to 100% of other projects. It also requires national government co-financing at least 25%. The total budget for this is €3 640 million.

Structural Funds evaluation

Given the size and significance of the EU aid package, legislation in the form of the Council Regulation No. 1260 of 26.06.99 requires the appraisal of the structural funds as well as a regular reporting on the economic and social cohesion in the EU. Analysis of the impacts of the EU regional policies is a crucial aspect in reforming the EU structural policies in order to maximise their benefit following enlargement. However, such a review must take into account that regional development in the CEECs is likely to be different due to the specific features of the transition economies.

Despite the existence of numerous empirical studies of EU regional convergence, the insights that policymakers can gain from them is limited since there are a number of problems which are common to the majority of existing empirical research that address policy evaluation. First, until recently a lack of a sound EU-wide regional database limited the analysis to small selection of regions and time periods which might bias the results which can be drawn from the analysis[11]. Second, the EU has been developing gradually, with integration occurring steadily between various states at various times. This leads to evolving convergence benchmarks and blurs the assessment of policy impacts. Third, as was outlined above most of the countries have implemented independent regional policies prior to introduction of EU structural and cohesion funds in 1994, which makes it almost impossible to identify the impact of EU regional policy independent of these other policies. This difficulty appears to be even more serious given different objectives pursued by national regional policies and given the long-term impacts of regional policies.

On the methodology side, five evaluation approaches are commonly used to assess the effectiveness of EU regional and cohesion policies: case studies, I-O models, CGE models, single equation econometric models and multi-equation econometric models (see Ederveen et al., 2002, for review of some of the evaluation techniques). Evaluation based on fully specified macroeconomic models is discussed, e.g., in Bradley et al. (1995), Roeger (1996) and ESRI (2002). The main advantage of such model-based evaluations is that they allow estimating policy impacts compared to the base-line scenarios that assume no policy intervention. Of course the theoretical underpinnings of these models play an important role in determining the size of the impacts. Thus, for example in the QUEST model (Roeger, 1996) crowding out reduces the overall estimated impact of the Structural Funds. The HERMIN macro-modelling framework on the other hand incorporates mechanisms from the endogenous growth literature, which capture the long-run supply side impact of the Structural funds, through investment in human capital and

[11] Data limitations are described, for example, in Midelfart-Knarvik and Overman (2002).

infrastructure (see Bradley, Morgenorth and Untiedt, 2001). Indeed the estimation of the long-run impact seems to be more important than the estimation of the simple Keynesian demand side impact of the Structural Funds since the Structural Funds aim at changing the economic potential of a region over the long run rather than to provide a short run cash injection.

Beutel (2002) applies an input-output methodology to CSF impact analysis at the macro-regional level (East Germany and the Italian *Mezzogiorno*) and at the national level: Greece, Ireland, Portugal and Spain. However, in addition to the problem of updating input-output tables, it is very difficult to incorporate supply-side (or neo-classical) adjustment mechanisms into a static input-output framework.

Another regional modelling framework is that of Treyz (1993), which has recently been extended to incorporate aspects of the new economic geography (Fan, Treyz, 2000 and Treyz, 2000). However, the earlier (1993) work - although articulated at a very high level of spatial disaggregation - is based mainly on a simple income-expenditure framework, and ignores most aspects of the supply-side adjustments that arise as a result of targeted structural fund interventions. The more recent "new geography" model (2000) is still at a highly experimental stage and may be difficult to operationalise in the context of integrating its insights with the body of existing European work on the structural funds.

Overall, the empirical evidence of the success of the EU structural and regional policies has been mixed. In addition to the methodological factors already mentioned, conclusions regarding the effectiveness of EU regional and cohesion policies depend crucially on how the policies are defined in terms of their targets and instruments used to measure the EU contributions. Furthermore, extracting impacts of other factors and policies that can be captured in the regression analyses (e.g. structural change in rapidly developing cohesion countries) can alter results significantly. Another element of difficulty is the definition of geographically relevant regional unit, as this involves interpretation of policy objective[12]. Analysis that focuses on too disaggregated regions may pick up natural heterogeneity as a lack of policy success, or vice versa. Therefore, most of the empirical evidence on policies' effectiveness should be treated with caution and certain degree of scepticism.

De la Fuente and Vives (1995) in their study of the impact of the EU regional development fund (ERDF) and of public investment in infrastructure and education on income levels across Spanish regions find support to the success of the EU policies in that they boosted regional convergence. Measured by its standard deviation, regional dispersion of per capita GDP was reduced in Portuguese regions in 1985-98 and Greek regions in 1975-85. Since 1985, per capita income dispersion in regions of Greece has increased again (Basile, de Nardis and Girardi, 2002). Tondl (1999) in her assessment of regional income convergence in the EU Southern regions showed that the regions are differently endowed with the typical growth factors such as public and private capital and educational attainments, and therefore might require different regional development

[12] This is a type of problem that is usually referred to as the modifiable areal unit problem. This refers to the possibility that an empirical analysis that is carried out over different levels of spatial aggregation will find differing results.

strategies. Overall, she finds a positive significant impact of public investment on regional income. Finally, De la Fuente (2002) estimates the impact of EU Structural Funds for the period 1994-99 on Spain in a regional panel data analysis. He finds that the overall positive impact of EU policies was quite sizable, eliminating 20% of the initial gap in income per capita between the assisted regions and the rest of the country.

On the other hand, a number of studies indicate failure of EU regional policies to reduce regional income disparities. Sala-i-Martin (1996) finds that government expenditures are not correlated with the overall process of regional convergence in Europe. Fagerberg and Verspagen (1996) find that EU support for R&D in the 1980s does not explain the rate of regional growth. More recently, Ederveen et al. (2002) explore the effectiveness of EU Structural Funds in a panel data analysis for 13 EU countries (excluding Germany and Luxemburg) across seven five-year periods from 1960 through 1995. They find that, overall, Structural Funds variable is not significant in explaining average annual growth rates of real GDPs per capita. However, using different instruments to measure quality of institutions they conclude that Structural Funds are effective when allocated to the most open economies with "good" institutions. Along the same lines, Boldrin and Canova (2001) found that regional disparities across EU have been persistent and there is no statistical evidence that EU Structural Funds had positive impact on factor productivity in Greece and Spain. It must be mentioned that they do not estimate what would be the path of divergence without EU support.

Some academic studies have looked at the impact of particular EU-funded projects on regional development. Vickerman et al. (1999) analyse how big infrastructure investments like TEN-T for high-speed rail may raise the rate of national convergence at the expense of increasing regional disparities. They point out that infrastructure links tend to be located within and between core regions where the transport demand is the highest. Under the assumptions of NEG models, this may largely benefit the core regions leading to further regional divergence. Empirically this hub-and-spoke effect is captured by Lafourcade (1998) for highways in France, and indirectly by Midelfart-Knarvik et al. (2000) for EU regions.

In contrast to the cohesion countries the CEECs have not only a development gap towards industrialised countries, but also more pronounced disparities between the regions within the country. Nearly all the CEE countries have experienced a drastic micro-economic adjustment during the initial years of transition that hit particularly severely the more industrialised regions. The economic integration with the EU, loss of traditional export markets and distortion of the vertical linkages resulted in a slump in highly specialised regions of the CEECs that were a part of a planned production structure. This increased regional disparities, promoting the growth in the capital city and border regions that had good access to the EU market and EU-originated FDI while stagnating economic development of the peripheral regions.

Hallet (1997) distinguished three different areas in the CEECs that require an adjustment of existing EU regional policy: i) the old industrial zones; ii) the backward regions; and iii) regions with development strengths and potential. A recent empirical study of the regional specialisation of the CEE countries during the 1990s showed that the growth

poles have concentrated around the capitals or in the urbanised border regions (Nijkamp et al., 2003). Given the current differences of income per capita at the national level (most of the accession states have a per capita GDP below 45% of the EU average), the regional disparities will be more difficult to reduce. A new policy approach should take into account potential industrial restructuring within the enlarged EU, determining the characteristics that would enable regions to be linked into production pattern and increase their competitiveness.

Based on historical evidence, Boldrin and Canova (2003) identify two types of policies that appear to be particularly relevant to the effectiveness of convergence. First, public programs for long-term income support, corporate subsidies and other forms of income transfer are found to have a negative effect on economic growth. This is probably due to the well known disincentive effects that such policies lead to. Second, growth-promoting effects are associated with the active labour market policies and measures directed at improving capital mobility. Also, policies appear to be more effective if there is a complex policy mix that encompasses different levels of government.

The analysis in Boldrin and Canova (2003) is not particularly sophisticated and the results are therefore somewhat questionable. In particular, their assessment of the macroeconomic characteristics of CEEC10 and EU15 and of nature of existing regional disparities within CEEC10 and EU15 is based on very crude estimates that do not account for structural transition a la Blanchard U-shaped recovery curve. Moreover, it is very likely that economic integration between CEEC10 and EU resulted in a number of structural changes in the accession countries that only recently have been captured by statistical data. Therefore, drawing parallels between cohesion and transition economies with respect to EU regional policies requires more in-depth research.

Enlargement is likely to speed up a reform of the EU regional and structural policy framework due to both the specific features of the transition economies policy-makers will have to address and the budgetary pressure associated with increased number of countries that are eligible to aid. Already, EU policies have been evaluated qualitatively, and a number of academic studies pointed at weaknesses in the existing framework that can be addressed and improved without necessarily increasing the current levels of public financing (see e.g. Bradley et al.,2001 Weise, 2002).

Structural Funds reform

With enlargement the reform of the Structural Funds will be necessary. In particular this reform will inevitably require a shift of resources towards the NMS and away from the recipient regions in the EU-15. Another change to the Structural Funds is a change in the terminology. The financial allocations that were previously designated by the term "Objective 1" are now designated under two headings: the *Convergence Priority* (previously termed the Structural Funds) and the *Cohesion Fund.*

The impact of this reorientation has been evaluated by (Bradley et.al. 2004) using the familiar HERMIN modelling framework for the next (post-2006) round of expenditure on cohesion policy. The countries/regions involved in the analysis are three of the original

four "cohesion" countries (Greece, Portugal and Spain); the two present Objective 1 "macro-regions" in Germany and Italy; the ten new member states; and two candidate countries (Bulgaria and Romania).[13]

In order to assess the impact the analysis is conducted with and without the cohesion policy interventions. Thus, the counterfactual against which the policy is evaluated involves running the models in the absence of cohesion policy, which is highly artificial since in the absence of cohesion policy member states may enact at least some similar policies. Nevertheless, some interesting results were obtained.

The main macroeconomic variables, which were accessed, were GDP, total employment, labour productivity, and unemployment. An important element of the study was that a clear distinction must be made between the short-run demand effects of convergence and cohesion policy expenditures (i.e., the effects generated during the implementation of the actual policy programmes) and the longer-run supply-side effects (i.e., the effects that become manifest mainly after the investment expenditures have ceased on the completion of the policy programmes, and when beneficial effects flow from improved stocks of physical infrastructure, human capital and productive capacity). Given the range of outputs and the fact that it is long run impact that are of key interest, the results were summarised in a cumulative multiplier which defined as the cumulative percentage change of GDP due to the CSF divided by the cumulative CSF as a percentage of GDP. Clearly only if this multiplier is larger than one is there a positive impact of the structural funds. The highest impacts were predicted for the Czech Republic, Estonia, Slovenia, Poland and Portugal. Particularly poor impacts are predicted for Greece East Germany and the Italian Mezzogiorno. These results appear to support the shift of emphasis towards the NMS.

[13] Ireland was an Objective 1 and cohesion country under CSF 1989-93, CSF 1994099 and CSF 2000-2006. However, because of its rapid convergence, it is excluded under CSF 2007-13.

4. Conclusions and Policy Implications

This research project advances the state of the art in the area of changes of regional production structures in the context of increased integration in a significant way through *the detail and nature of the analysis* carried out by the research team. Thus, given that the analysis was carried out for a *wide range of countries at a fine level of sectoral and regional disaggregation*, the *policy conclusions are more robust than those previously derived through more aggregate analysis*. This point is important since specialisation and agglomeration effects have a very limited spatial extent so that a high level of spatial aggregation risks 'averaging out' such effects. Similarly, carrying out the analysis with the most disaggregated sectoral data is important as again aggregation risks loosing the local impact. The *spatial coverage* of our analysis is also important for the transnational applicability of our policy conclusions. As the analysis covers some 14 EU member states and two accession countries (Romania and Bulgaria), *all types of regions are covered* in our analysis.

The Rationale and Level for Policy Interventions

In order to derive useful results it is important to first consider the rationale for policy interventions. The *key aim of national and EU regional policies* is to decrease the disparities between regions, while at the same time maintaining the highest possible level of economic activity in all regions. The rationale for regional policies can be supported through a number of arguments as discussed below.

Firstly, if regional disparities become too large, a political entity such as country or indeed a supernational body such as the EU could be destabilised, as the inhabitants of the poorest regions are unlikely to be satisfied with this situation, resulting in civil unrest or the rise of radical parties. This is of course not an economic argument for policy interventions but a *political argument*, but this makes it no less important.

Secondly, if disparities become too large, regions may fall into a *poverty trap*, from which they might not be able to escape using their own resources. For example the NEG models suggest a process of cumulative causation. Here if some sectors are facing increasing returns to scale and transport costs market size differences will lead to a progressive relocation of the IRS industries to the core. As more and more firms locate in the core, the periphery becomes progressively less attractive for firms in these sectors. Similarly, the endogenous growth literature suggests that convergence is not guaranteed, and especially where externalities through human capital, R&D or infrastructure exists, governments that have the sufficient resources, can substantially increase growth. Conversely, poor countries and regions may not be able to achieve these higher growth rates as a lack of resources constrains the amounts that can be invested in these key areas.

This latter argument suggests that with appropriate assistance lagging regions may be able to escape this trap, resulting in higher incomes and thus higher purchasing power, which would benefit all regions. Thus, overcoming disparities might be a Pareto optimal move in the long-run.

Finally, if regional disparities are due to *market failures*, then any regional policies that tackle the market failures are obviously called for and such a policy will be welfare improving in all regions. This rationale is more in line with the neoclassical growth and trade theories, which predict convergence once all markets are working properly.

Of course one may also consider core - periphery patterns as optimal where policies to reduce disparities reduce overall welfare. However, in such a situation *policies to enable free factor movements* are important since otherwise equity issues would again require policy initiatives.

Given the above discussion it is also important to consider *at which level policies should be enacted*. Depending on the nature of the problem that policy is trying to address different policy actors are better placed to deliver the policy. For example if the key issue is simply that a lack of resources to invest is constraining some regions policies should be enacted at the *national or supernational* (e.g. the EU) level. Here it is noteworthy that the analysis for the Single Market (the Ceccini Report) highlighted the fact that poorer countries and regions may loose and thus counteracting policies were necessary. Of course poor regions may be located in poor countries suggesting that in this case the supernational level is more appropriate. A similar argument can be made if equity issues are at the heart of the policy. The EU has always had a policy of *increasing cohesion*, that is to reduce disparities, and this has been a major driving force behind the Structural Funds. Finally, ensuring that markets function properly may require interventions at *different levels of government*. Given that market failures are *cross - country market failures* there is *a clear role for the EU to get involved* alleviating such problems. However, often the problems occur with in a country and may be difficult to identify at a supernational level, so that there is also *a clear role for national and regional governments*.

Regional Structural Change and Cohesion in the Enlarged EU

While there is real convergence between regions within the EU-15, *the disparities within the EU are still considerable* and with enlargement the difference between the richest and poorest regions *have increased significantly*. For example the poorest region in Romania has a GDP per capita which is just 17.2% of the EU-15 average. On the other hand, Brussels has a per capita GDP that is over double that of the EU-15 average. This suggests that on equity grounds alone policy interventions might be needed. However, simple large-scale transfer payments that are not aimed improving the economic structure of the poorer regions are unlikely to have any long-term impact. Indeed there is evidence that if the underlying economic and institutional conditions are not appropriate, that even structural policies are likely to fail. It is important to note that policies that make the better off regions worse off while not generating any sustainable increase in living standards in the poorer regions are clearly sub-optimal.

Given that many NMS regions have lost out through the transition and integration processes and since large disparities among EU-15 regions persist a *role for regional policies remains*. However, what is important is to consider the *causes* of these disparities. The focus of this project was to investigate to what extent the integration

process has impacted on the degree of regional specialisation, which in turn might impact on regional economic performance and thus influence disparities.

While there is weak evidence for the NEG models, *the predicted catastrophic relocation of economic activities to the centre is not apparent*. Nevertheless, *central regions have a more favourable industrial structure* to ensure their future success since they tend to be more specialised in knowledge intensive sectors. Evidence for *emerging core-periphery patterns is apparent in the NMS*, where regions that have borders to non-EU countries have been subject to *negative structural change*. Particularly *regions that have a high specialisation in primary activities tend to perform badly and have low incomes*.

The *EU-15 regions appear to be converging in terms of industrial structure and per capita GDP*, the slow changes of the degree of specialisation appears to be supporting convergence. Given the *slow speed of diversification* it is reasonable to consider that policies be introduced that *speed up the convergence of industrial structures* since this could benefit the speed of convergence.

This conclusion also corresponds with the observation that those regions that are more focused on the primary sector, which implies a significant difference from the average industrial structure, have performed poorly. Thus, rather than focusing substantial funds on the support of the agricultural sector, *a reorientation of these resources towards more advanced sectors could help reduce regional disparities*.

Similarly, regions that are specialised in resource intensive industries appear to be performing poorly, and instead of supporting these industries, *policies that deal with the transition costs for the reorientation of regions towards more sustainable industries, should be pursued.* An important focus of this reorientation should be placed on *training and other labour market initiatives* that would overcome hysteresis effects.

In general, at least *for EU-15 a more diversified industrial structure appears to be more beneficial than one that is highly specialised.* In the *NMS the converse appears to have been the case*. On the face of it this may be difficult to reconcile. However, it is likely that for the NMS, those regions that were highly specialised in sectors, in which they had a comparative advantage did well. This is likely to include sectors which are labour intensive but that have particular skill requirements, which those regions that are specialised in these sectors can utilise. In the medium to long - run if this advantage is eroded, perhaps due to competition from outside of the EU, this current advantage might turn out to be a disadvantage as it appears to be for EU-15 regions specialised in resource intensive industries.

Since 1988 the *EU Structural Funds* have been the main EU regional policy. These are provided on a programme basis for a planned period so that there is certainty of funding for some time. In general these have been focused on three particular aspects, namely infrastructure, human resources and aids to the private sector. Both the infrastructure and human resource aspects of the Structural Funds are aimed at improving the underlying potential of the regions, while the aids to the private sector provide subsidies to various private sector activities including marketing and R&D.

Our analysis does not provide any evidence about the underlying potential of the regions and thus cannot make recommendations on the infrastructure and human resources parts of the Structural Funds other than to recommend that these should be *supportive of easing the adjustment to change and diversifying the economic structure*. In relation to the aids to the private sector, more clear-cut recommendations can be made. Firstly, for the EU-15 these should not be focused on traditional resource intensive industries, which are declining. Rather, they should aim *to diversify the industrial structure and in particular aim to promote knowledge intensive activities* (which should be supported by appropriate human resource and infrastructure investments).

The Role of FDI in Regional Development

A number of transition countries have attracted significant amounts of FDI, mainly from Western European countries, and several now rank quite high in this regard by international standards. However, *large disparities in the distribution of FDI* have emerged both *across and within countries*. In particular, low-income candidate countries have lagged behind Central European new member states in their ability to attract FDI.

Sectoral patterns of FDI similarly reveal that *CEECs represent a favourite location mainly for low-tech foreign firms*, which found there skilled and cheaper labour force as well as well experienced domestic firms operating in upstream and downstream manufacturing sectors. High tech FDI represent one third of the total number of foreign affiliates and concentrate the most in the more developed countries and or regions of the sample. This *uneven distribution is* likely *to exacerbate the income gaps between and within countries*, especially as economic growth and FDI interact in a virtuous cycle.

This project has found that *FDI has had a significant impact on industry location in CEECs*, especially those which have received substantial amount of FDI, as Hungary. However, the analysis has provided new evidence that *even in the countries characterized by a large penetration of FDI, growth rates are not enough to narrow income gaps*. The analysis presented here suggests that there have been *few or no positive spillovers from foreign to domestic firms* in the considered CEECs. Although this result needs to be further explored, it may be due to the fact that *an extensive presence of foreign firms has hindered the adaptation of domestic firms to the new market system through an intensification of domestic competition*. Moreover, some traditional suppliers of foreign firms have followed them giving rise to foreign firms *clustering and agglomeration* and thus *pre-empting or delaying the development of suitable domestic suppliers*. Determining an optimal degree of foreign firm penetration deserves further attention.

Foreign firm clusters without linkages to domestic economy might lead to the emergence of "*enclave" economies*, with highly competitive foreign firms and lagging domestic enterprises. This duality might affect patterns of growth, further increasing regional disparities and inequalities. According to the results of our analysis *foreign firms contributed to regional growth, but not to convergence patterns*.

These results raise some policy questions and concerns. Some of them can be generalized, others, instead, are specific to the considered countries' experience.

A first concern regards the *sectoral composition* of FDI. According to our results this seems to be too unbalanced towards *low-tech manufacturing sectors*. This implies that the technological transfer from foreign to domestic firms might be limited in scope. Consequently, the contribution that FDI may have on sustaining growth in the long run is limited, too. Moreover, low-tech foreign firms are more *footloose* and less embedded into the local economy than high-tech foreign firms. This is due to the fact that cost advantages, and mainly, labour cost advantages, diminish over time, because of the improvement in the labour standards due, among other things, to the implementation of the *acquis communautaire*. This might become a severe problem for Romania and Bulgaria.

Numbers are important, but what matters the most is the *quality* of FDI. To this purpose, *linkages should be further stimulated* by appropriate policy interventions. In order to increase their effectiveness, the latter should however be targeted to domestic firms rather than foreign firms. *Stronger local firms not only attract FDI but are also able to exploit benefits emanating from them*.

Once FDI are allowed to enter a country, *economic determinants* are more important than *policy factors*. Thus, the right instruments to attract FDI are policy interventions aiming at improving *market access, infrastructures, labour market conditions*, etc. rather than granting fiscal and financial incentives. Here the idea is that *FDI alone does not suffice to foster regional growth and generate convergence processes within countries*. In other words, *FDI cannot be considered as a substitute for regional development policies*. They can offer a positive contribution to growth and development of laggard regions when integrated into a *broader regional development strategy*. This implies that Special Economic Zones (SEZs) and Industrial Parks (IPs) per se do not suffice for attracting FDI. They are effective only when supported by economic policies aiming at *improving the economic conditions* of a region.

Therefore, only by *concentrating resources sectorally*, *spatially and technologically* would it be possible to come close to creating conducive conditions for cluster generation and MNEs embeddedness.

It is worth noticing that *attracting new investment is important*, mainly if the existing pool of investment in the host country is rather limited. However, once FDI is allowed to enter the country, it is just as important to nurture MNEs with existing investments. This is because they are the firms with the higher probability of making new investment in the same location. *The monitoring and aftercare* of foreign investors are aimed at generating incremental investments. Moreover, satisfied investors are the best evidence of a good investment climate in the host country and therefore, they can attract other investors. If the expansion of a foreign affiliate is not possible for reasons beyond the reach of the host country, after care policies become a key factor in *retaining the exiting level of investments*, i.e. preventing divestments.

Competition for attracting FDI occurs across regions rather than countries. FDI attraction policies should take this aspect into account in order to be effective. Do regional institutions really know their direct competitors? Moreover, it has been demonstrated that the response of foreign firms to the same locational advantages might be affected by *sector-specific effects*. This indicates that promotion policies should be differentiated according to the sector of manufacturing activity of the foreign firms.

The strategy followed by the targeted countries in attracting FDI raises *country-specific policy concerns*.

Hungary has successfully attracted a considerable amount of FDI, mainly in high-tech sectors. However, three regions only emerge as preferred location for FDI, i.e. those lying in the North Western part of the country between Budapest and the Austrian border. This raises, on the one hand, the unpleasant perspective of an upsurge of the divide between the Western and the Eastern part of the country; on the other hand, it suggests that those regions possess the appropriate mixed of economic and policy factors to succeed in the FDI tournament. Thus, they can be considered as a "best practice" in FDI attraction and further analysed in order to understand whether and to what extent their experience can be exported in other regions and/or countries.

Poland raises some concerns regarding the sustainability in the long run of its locational advantages, as indicated by the fact that no Polish region with the exception of Mazowiekie shows a concentration of FDI above the average of the whole CEE at the end of the 1990s.

As far as *Bulgaria* is concerned one may wonder whether the small number of foreign firms located in the country is due to the slow improvements recorded by the economic factors or, rather, to the lack of a political will. Is the FDI regime sufficiently open to generate a consistent inflow of FDI? If not, it has to be further liberalized in order to create the necessary conditions for foreign firms to enter the country and pro-active policies aiming at attracting new investments should be further reinforced.

Romania, instead, seems to have a problem of quality rather than quantity of FDI. FDI flowing into the country have been undertaken by small and medium sized foreign firms operating in labour intensive sectors. As said before, efficiency seeking FDI strongly depends on factor cost advantages, which do not last over time. Thus, it becomes important to improve those policy and economic factors which high-tech foreign firms rely on when looking for a foreign location for their production plants. Aftercare services might help in reducing foreign firms' mobility.

A final concern regards the possibility that these countries will fall permanently behind in the FDI attraction game. Countries which attracted FDI at the beginning of the transition phase have gained advantages, in terms of investor friendly reputations and increased probability of attracting either additional investments by the already established affiliates or new FDI, given that new foreign firms can enter the local market because of the agglomeration economies emanating from the already established MNEs. This concern receives some support our research findings, at least as far as high tech foreign firms are

concerned. Laggard countries attracted a consistent number of low-tech foreign firms, even larger than that recorded for the leader recipient countries, mainly Poland. However, they are not the right type of FDI, given the limited technology transfer and the higher probability that they will move once location labour cost advantages will become less attractive. Both scholars and policy makers should pay more attention to the consequences of this unpleasant phenomenon.

On the whole, our research results are interesting from both the scientific and the policy perspectives. However, much might and should still be done in order to have a comprehensive knowledge of the role played by foreign capital in CEECs' processes of structural changes and integration within the EU. Further extensions of the analyses could be envisaged from a threefold perspective: *geography, industry and time*.

This project has analyzed a limited number of CEECs. These are undoubtedly among the most representative of both the new member states and the candidate ones. However, other interesting successful stories do exist among recently acceded member states, such as the Slovak and the Baltic Republics.

From a *sectoral perspective*, both the primary and the service sectors have been disregarded, since these sectors were not functional to the project's research objectives. However, the *service sector is gaining increasing importance in foreign capital inflows and outflows*, given the ascendancy of services in the majority of the world economies. This phenomenon has been particularly intensive in some of the CEECs, given the level of underdevelopment that they inherited from the past. Despite that, very little is known about determinants and the impact on the host economies of FDI in the service sectors.

Finally, the *time dimension* should not be underevaluated. Our research covered mainly the second half of the 1990s. However, most of the phenomena analyzed during the life-time of the project, such as linkages with domestic firms and changes in regional specialization and sectoral concentration take time to occur. Therefore, the weakness of the results we obtained on some of these issues might be partially explained by the short time period taken into consideration.

Needless to say, these extensions require a considerable effort in the collection and harmonization of appropriate data, with the necessary level of disaggregation, both at regional and sectoral level. Therefore, a further improvement in the provision of consistent data for sufficiently long time series on patterns of location of foreign firms and on economic indicators at regional levels becomes a necessary condition for a better comprehension of the role played by FDI in the recently acceded member states and possible predictions on what can happen in the candidate countries.

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Annex 1: Data Sets

Regional Indicators

The analysis of industrial concentration and regional specialization for the EU15 comparison is based on a unique database. Collecting, completing and conditioning these data and making them available to analysis on our internal net was one major effort of the project. The database draws on national data sources and consists of employment data, (usually) for NUTS2 regions, with a sectoral breakdown as deep as available, and for a time period as long as available. The coverage and the sources are shown in Table A1.1. In the case of enterprise surveys that are raised solely within the manufacturing sector, the data have, in many instances, been supplemented by data from Cambridge Econometrics (CE) in the area of agriculture and services.

Table A1.1 Description of national data sources for employment data

Country	Period	Regions	Industries	Source type	Source
Austria	1998-2003	9	60	Employment survey	Statistik Austria
France	1973-2000	21	43	Enterprise survey (manufacturing)	SESSI (+CE)
Germany	1980-2002	31	294	Employment survey	Bundesagentur für Arbeit
Greece	1980-1998	13	14		Nat.Stat.Serv.Greece
Ireland	1973-2003	8	100	Employment survey	Forfas
Italy	1996-2002	20	24		ISTAT
Portugal	1991-2001	7	222	Census	INE Portugal
Spain	1978-1992	18	96	Enterprise survey (manufacturing)	INE Spain (+CE)

This database allows for a more differentiated analysis due to a higher depth of the industrial breakdown in several of the countries analysed in the separate country studies, in contrast to most of the studies surveyed in the previous section. However, as this depth and also the classification scheme for the breakdown, as well as the coverage of the employment population and of the periods available, vary considerably between the country studies, the results from these studies are not directly comparable. In order to bridge this gap, for a EU15 comparison, we used in addition a dataset by Cambridge Econometrics (CE) to get an overview on the specialization of all 196 EU15 regions. It covers the years 1980-2003 and is disaggregated by 14 industries.

Table A1.2 REGSTAT Database Description

Spatial Disaggregation: NUTS 3

Structural Disaggregation: NACE 2

Variable	Unit	Bulgaria	Romania	Hungary	Estonia	Slovenia
Employment	Number of persons employed	1990-99	1990-99	1990-99	1989-99	1997-99
Employment by sectors of activity	Number of persons employed	1990-99	1990-99	1990-99	1989-99	1997-99
Employment by manufacturing industries	Number of persons employed	1990-99	1990-99	1990-99	1989-99	1997-99
Unemployed persons	Number of persons unemployed	1991-99	1990-99	1991-99	1995-00	1997-99
Unemployment rate	% of economically active population	1991-99	1990-99	1991-99	1995-00	1997-99
Average wages	Local currency, current prices	1990-99	1992-99	1992-99	1992-99	1997-99
GDP	€, current prices	1995-98	1993-98	1994-98	1996-98	1997-99
Domestic firms	Number	1990-01	1990-99	1991-99	1993-99	1994-98
Firms with foreign participation	Number	1990-00	1990-99	1991-99	1993-99	1994-98
Self-employment	Number of self-employed	1991-99	1991-99	1991-99	1996-99	1997-98
Population	Number	1990-99	1990-99	1990-99	1990-99	1990-99
Telephone lines	Number	1990-99	1990-99	1990-99	1990-99	1990-99
Cars	Number	1990-99	1990-99	1990-99	1990-99	1990-99
National public roads	Km of road/km^2 of territory	1990-99	1990-99	1990-99	1990-99	1990-99
Distance between counties	Km between capitals	1991-99	1991-99	1991-99	1991-99	1991-99
Public expenditure	Local currency, current prices	1990-99	1990-99	1990-99	1992-99	1995-99
Education	Number of students in higher education	1990-99	1990-99	1991-99	1992-99	1995-99

Sources: National Statistical Services / ZEI University of Bonn

Firm Level Data

In order to analyse foreign firms' location patterns, a **firm level database** has been built-up, using the empirical information included into the following two main sources:

1. **PECODB** database, which included at the start of the project about 2385 foreign investments undertaken during the 1988-1996 period in Central and Eastern European countries. This database was built-up at ISLA in 1998 with the financial contribution of the EC (Ref. SUB/96/83328/U.B.).

2. **AMADEUS** is a company directory maintained by Bureau Van Dijk which provides economic and financial information for over 7 million firms operating in all European countries. Amadeus provides time-invariant information such as the sector of activity, the year of incorporation, the legal form and the address for each firm, as well as time-variant economic and financial data coming from balance sheet and profit/loss accounts for the latest years (up to 8 years backward, from 1993 to 2000).

We extract from both databases information on foreign investment transactions entered in Bulgaria, Czech R. Hungary, Poland and Romania between 1990 and 2001. After having eliminated double counting, data have been cross-checked for accuracy by using individual firm web sites, when available, lists of foreign firms provided by local FDI promotion Agencies and Privatization Agencies as well as National Institute for Foreign Trade and Chambers of Commerce.

The final dataset includes about 5,230 manufacturing firms with a foreign participation of at least 10%.[14] Information included in the sample is listed in the box below which also reports the rates of coverage of each piece of information, in order to give an idea of the magnitude of missing values.

This firm level database assures a broad coverage of firms of any type and size and offers a number of advantages with respect to other traditional and more aggregated databases. It covers a relevant part of the transition phase and accounts for a high level of disaggregation at both the regional and the sectoral level. Finally, firm level data sets mitigate aggregation biases and allow controlling for a number of observable and unobservable firm characteristics.

[14] A firm has been considered as foreign if one or more foreign firms had a participation of at least 10% in this enterprise. This criterion follows the general definition of foreign direct investment adopted by international organizations, such as UNCTAD and FMI. See UNCTAD, *World Investment Report*, Annex B: Definition and Sources, UNCTAD, Geneva, various issues.

Box A1.1 Information included in the foreign firm sample (in parenthesis, rates of coverage)

- Name of the foreign affiliates (100% of records) ,
- Name (52%) and country of origin (98%) of the parent firms;
- Location (town) of the foreign affiliates (93%)
- Activity of the foreign affiliates – Nace, Rev. 1, four digits classification (100%)
- Date of incorporation (98%)
- Foreign Ownership in percentage (71%)

Original information has been further processed and classified from different perspectives. At *geographical* level, NUTS II and III level classifications of administrative territorial units have been added, while manufacturing sectors have been aggregated according to their technology content. Following a taxonomy developed by OECD[15] (OECD, 2000), four groups of sectors have been identified: high, medium-high, medium-low and low tech sectors. Details are shown in Table A1.3.

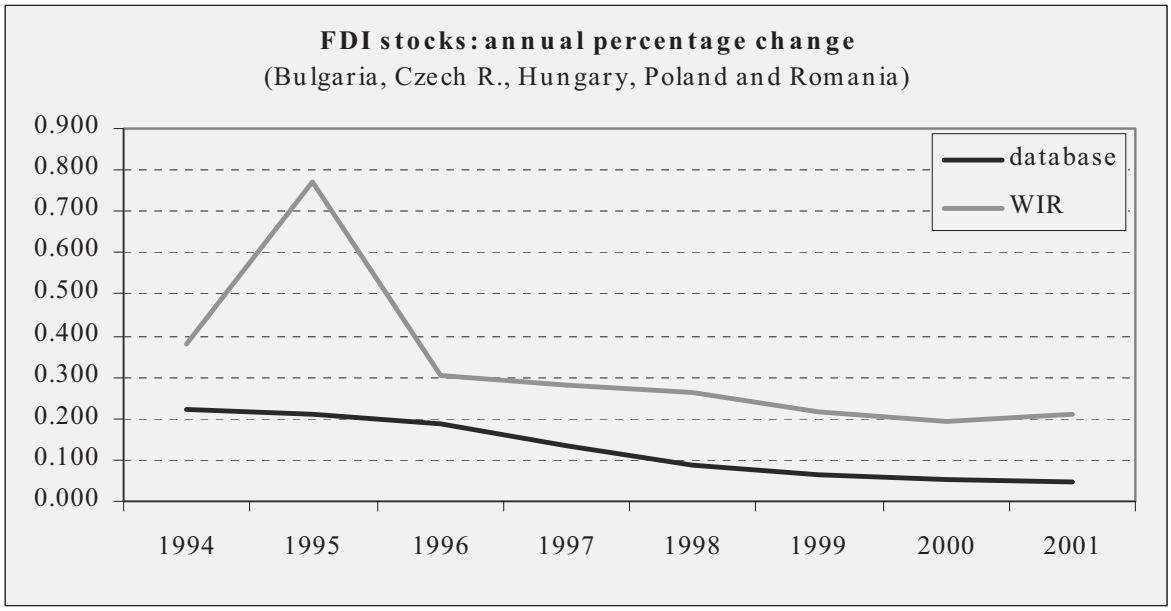
Before doing any kind of analyses, we checked whether and to what extent the data recorded in the database reflected true patterns of FDI in the targeted countries. In order to provide an answer to this question we compare the number of foreign firms recorded in our database with official FDI data provided by UNCTAD. As Figure A1.1 shows, the degree of similarity between the two groups of data is quite high and statistically significant at the conventional level of confidence. This indicates that the cost of differences is fully compensated by the benefit of having the maximum possible disaggregation of capital flows, both at geographical and sectoral level.

[15] OECD, ANBERD and STAN databases, May 2003.

Table A1.3 Classification of manufacturing sectors

High-Technology Industries	Medium-Low technology industries
Aircrafts and Spacecrafts (353) Pharmaceuticals (2440) Office, accounting and computing machinery (30) Radio, TV and communications equipment (32) Medical, precision and optical instruments (33)	Building and repair of ships and boats (351) Rubber and plastic products (25) Coke, refined petroleum products and nuclear fuel (23) Other non-metallic mineral products (26) Basic metals and fabricated metal products (27-28)
Medium-High technology industries	**Low-technology industries**
Electrical machinery and apparatus n.e.c. (31) Motor Vehicles, trailers and semi-trailers (34) Chemicals (excluding pharmaceuticals) (24) Railroad equipment and transport equipment (352, 353, 354) Machinery and equipments n.e.c. (29)	Manufacturing n.e.c., (36) Wood, pulp, paper products, printing and publishing (20-22) Food products, beverages and tobacco (15-16) Textiles, textile products, leather and footwear (17-19)

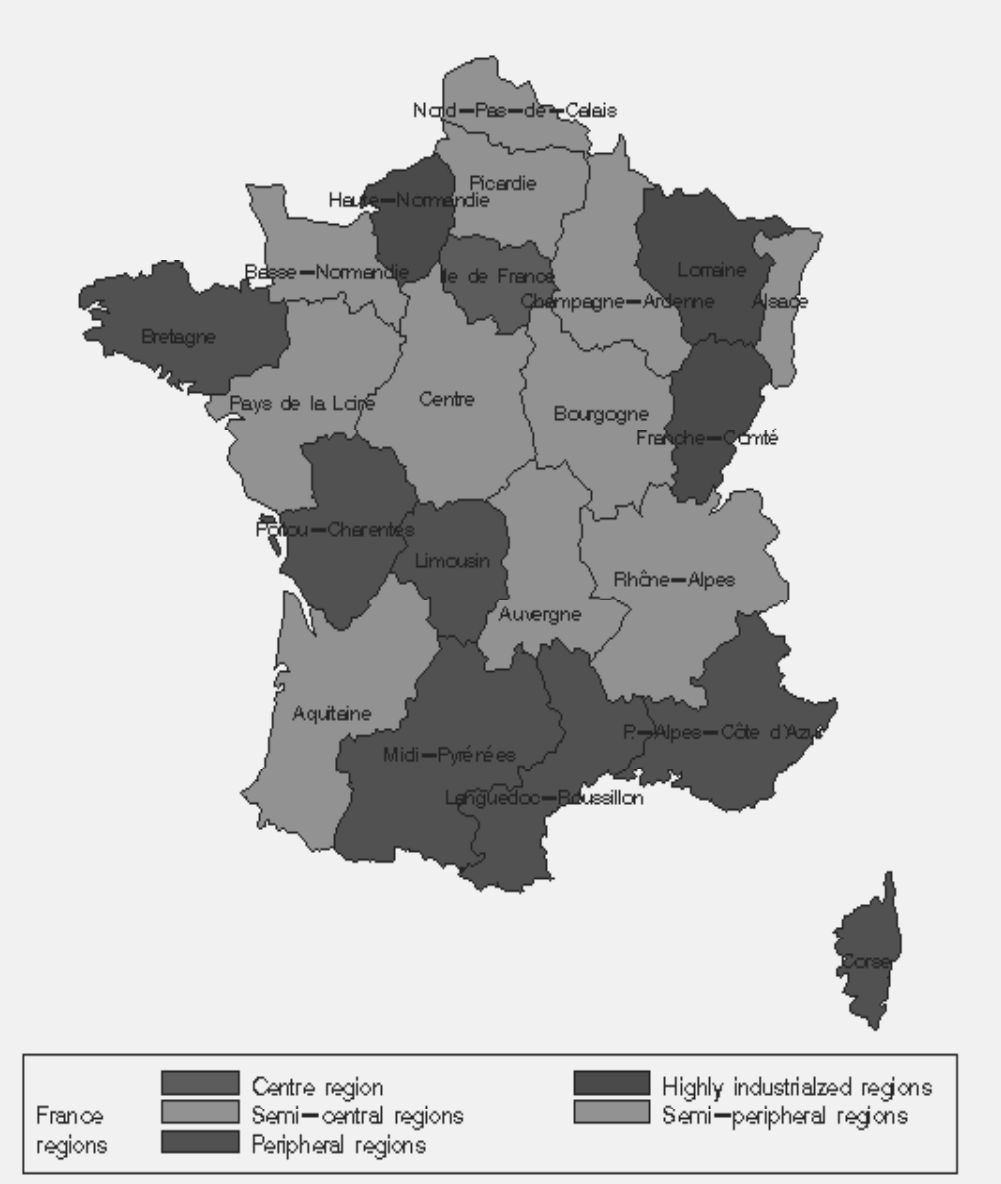
Figure A1.1 Validation of the database



Spearman rank correlation: 0.950 (p>0.0003); Pearson correlation.: 0.717 (p>0.045)
Source: Resmini (2005)

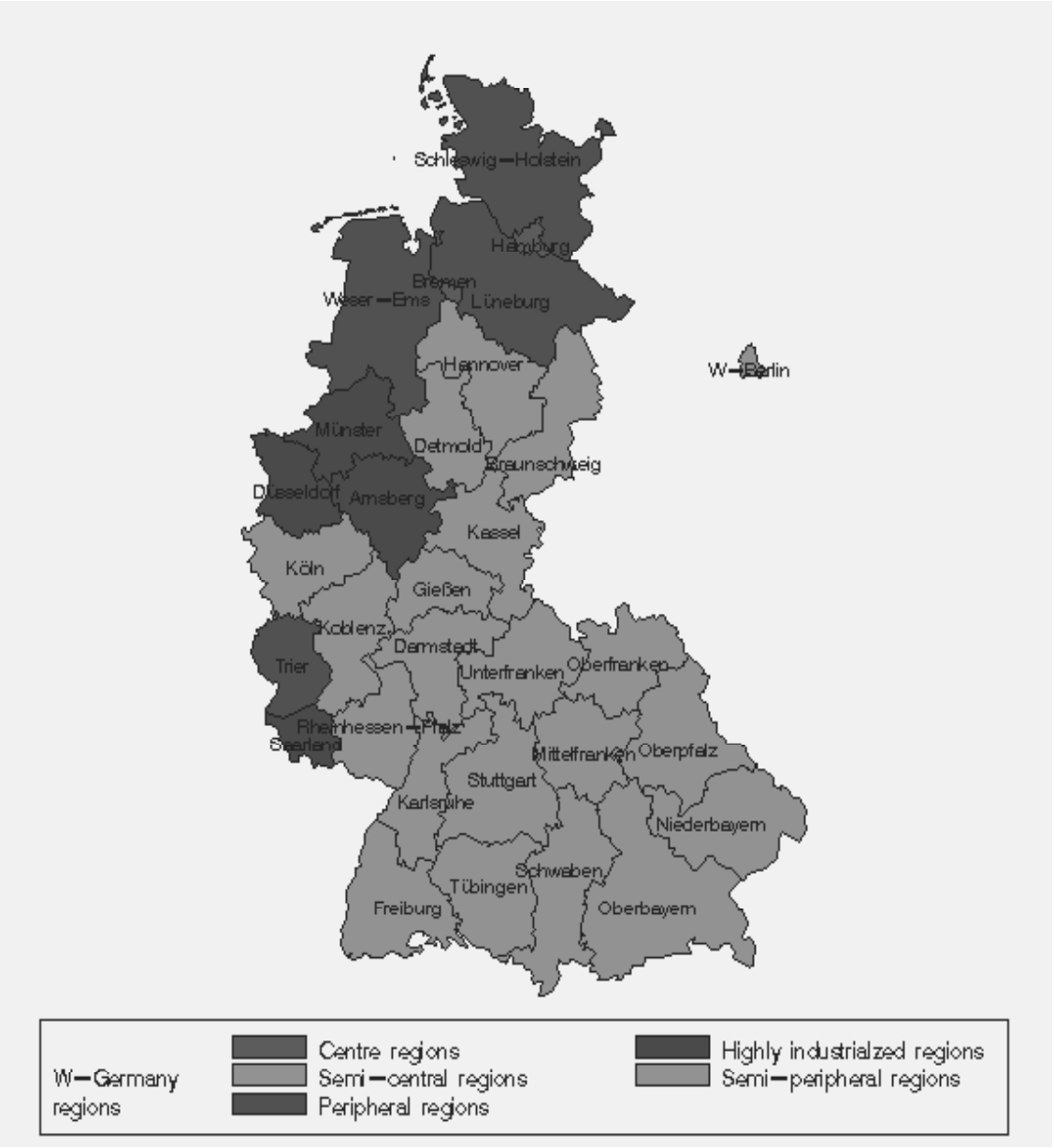
Annex 2: Maps and Diagrams

A2.1: Classes of regions with a similar industry mix : France



Source: Krieger-Boden and Soltwedel (2005)

A2.2: Classes of regions with a similar industry mix : Western Germany



Source: Krieger-Boden and Soltwedel (2005)

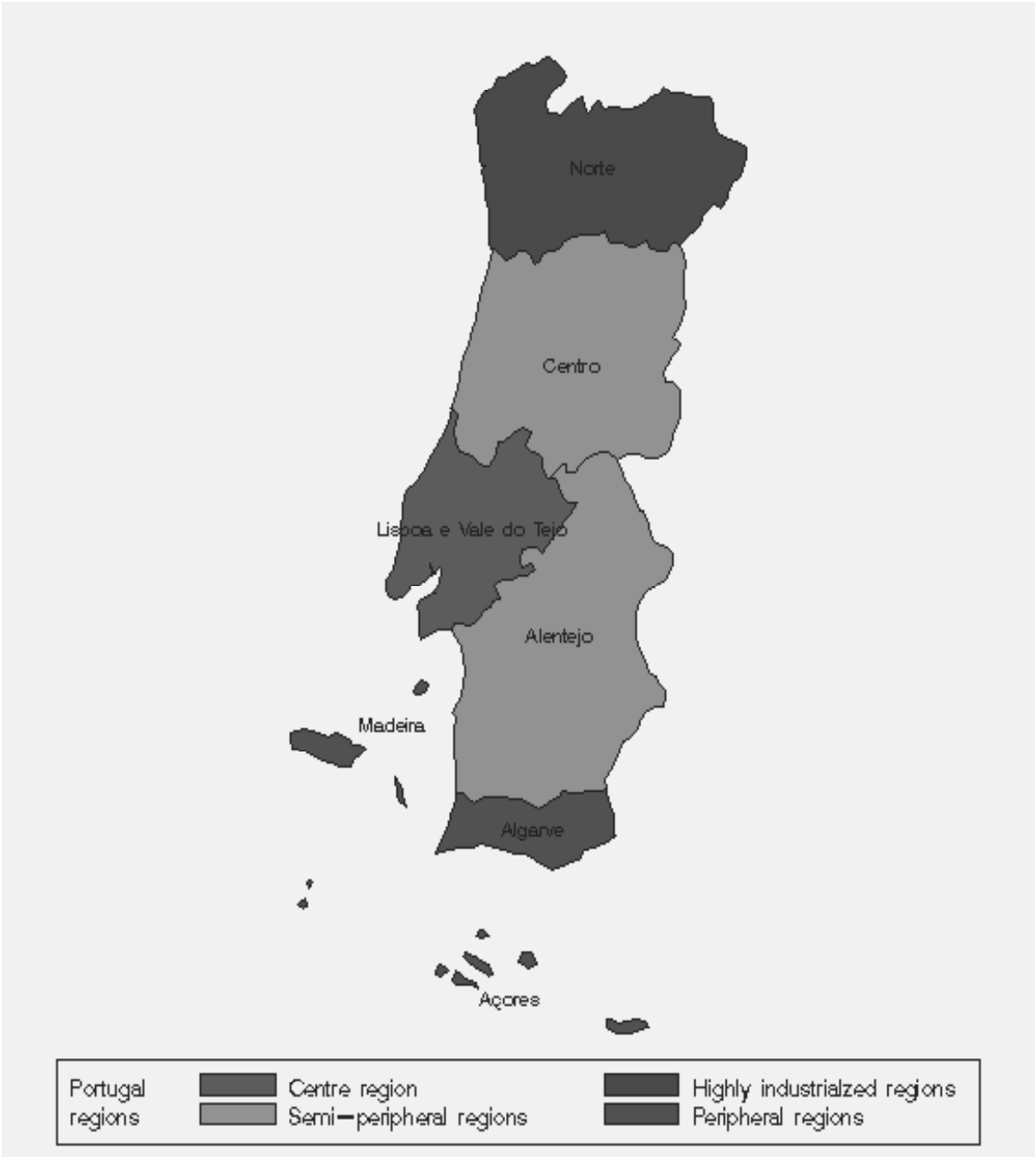
A2.3: Classes of regions with a similar industry mix : Eastern Germany

Source: Krieger-Boden and Soltwedel (2005)

A2.4: Classes of regions with a similar industry mix : Italy

Source: Krieger-Boden and Soltwedel (2005)

A2.5: Classes of regions with a similar industry mix : Portugal

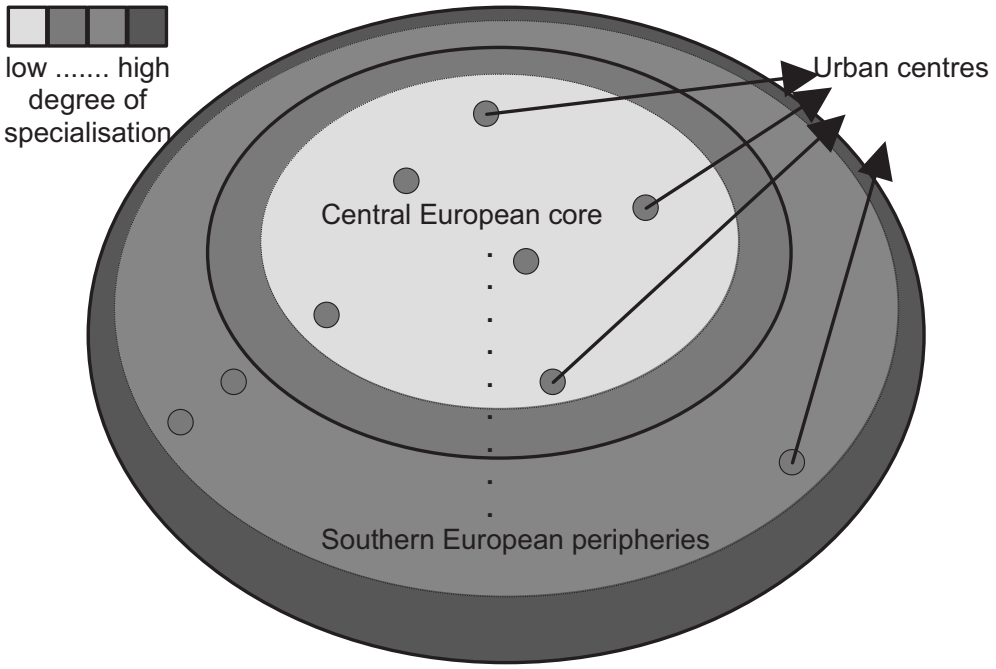


Source: Krieger-Boden and Soltwedel (2005)

A2.6: Classes of regions with a similar industry mix : Spain

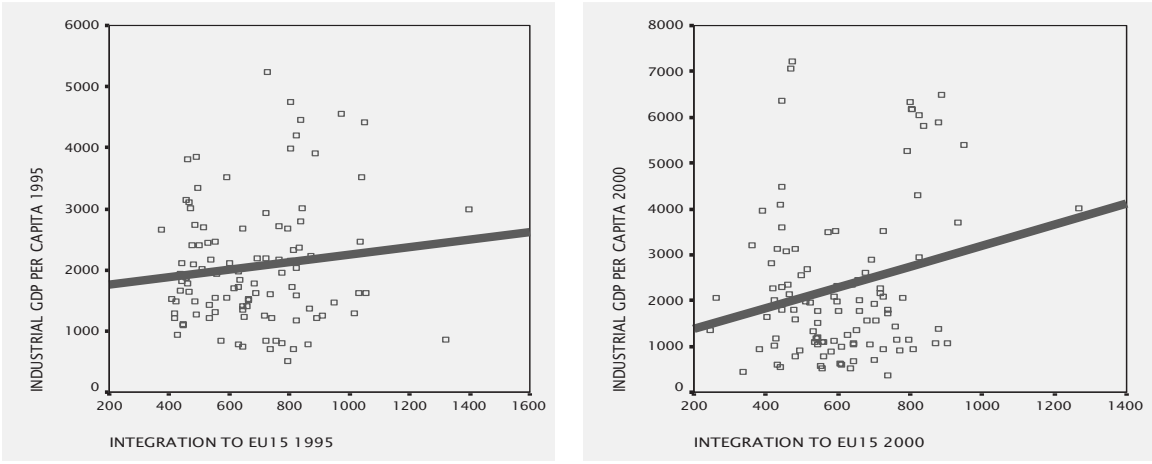
Source: Krieger-Boden and Soltwedel (2005)

A2.7: Schematic interpretation of regional specialisation in EU



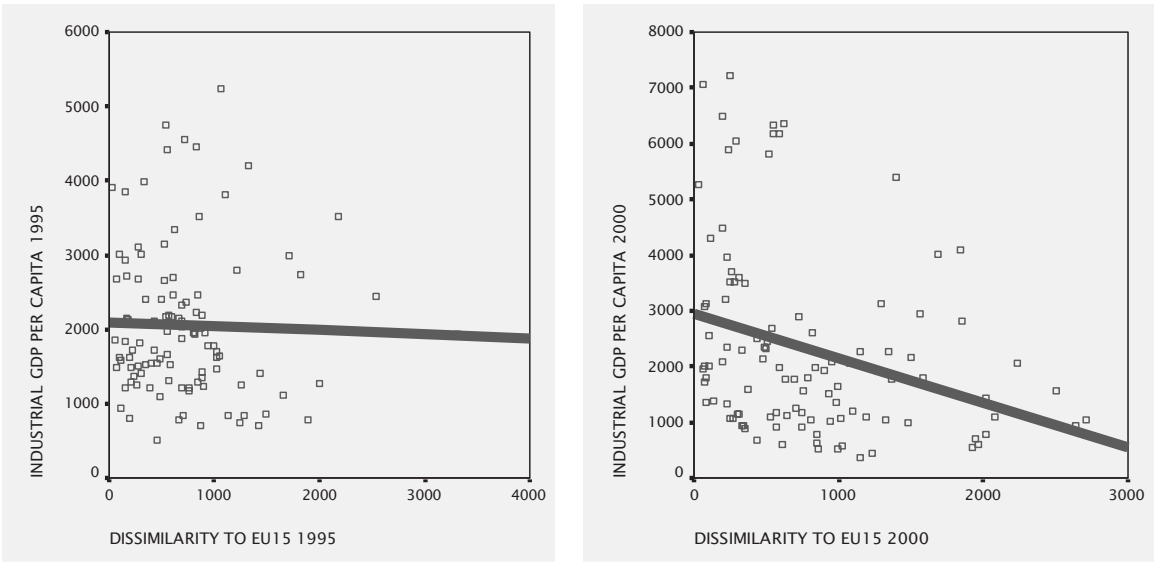
Source: Krieger-Boden and Soltwedel (2005)

A2.8: The impact of integration on industrial GDP per capita in the New Member States and accession countries, 1995-2000



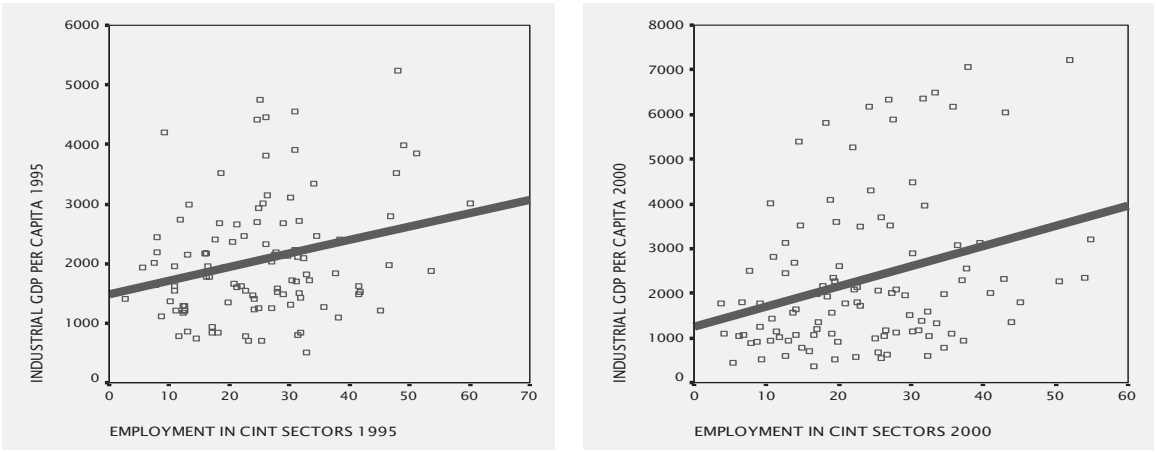
Source: Petrakos, Fotopoulos and Kallioras (2005)

A2.9: The impact of dissimilarity on industrial GDP per capita in the New Member States and accession countries, 1995-2000



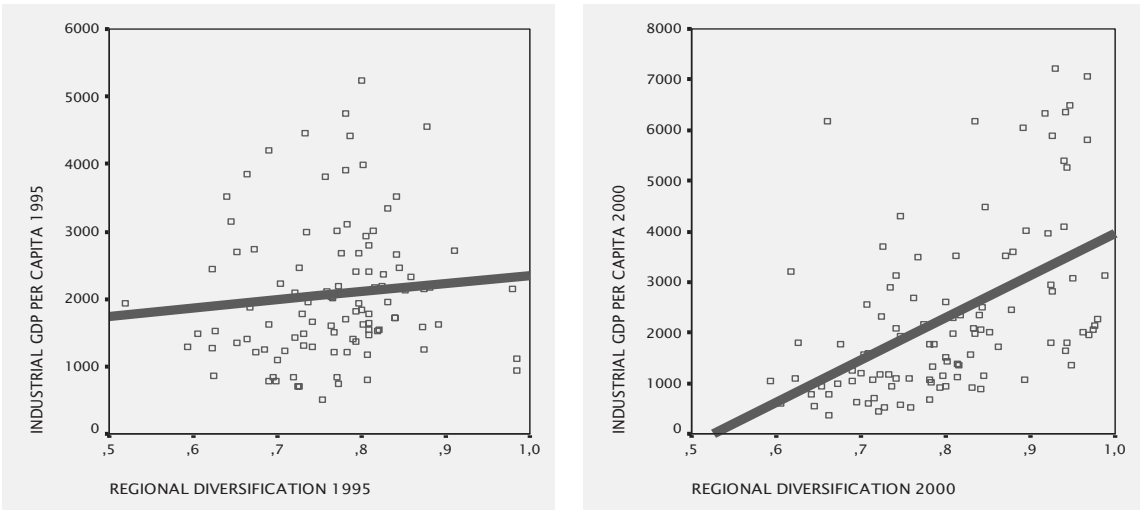
Source: Petrakos, Fotopoulos and Kallioras (2005)

A2.10: The impact of employment on CINT sectors on industrial GDP per capita in the New Member States and accession countries, 1995-2000



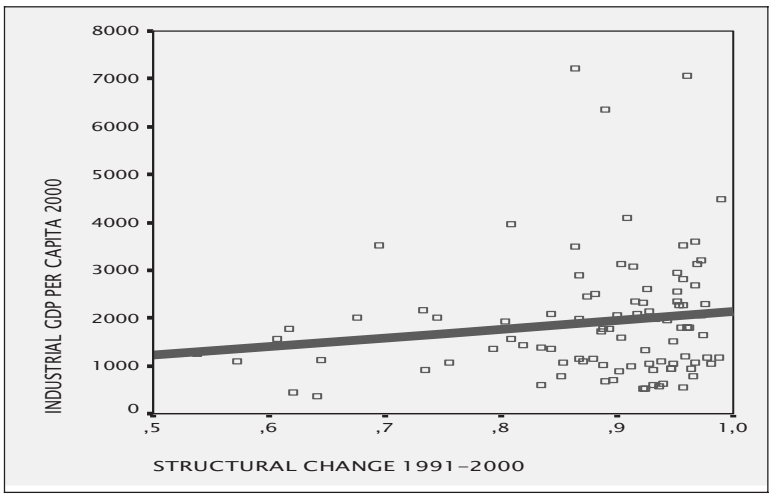
Source: Petrakos, Fotopoulos and Kallioras (2005)

A2.11: The impact of diversification on industrial GDP per capita in the New Member States and accession countries, 1995-2000



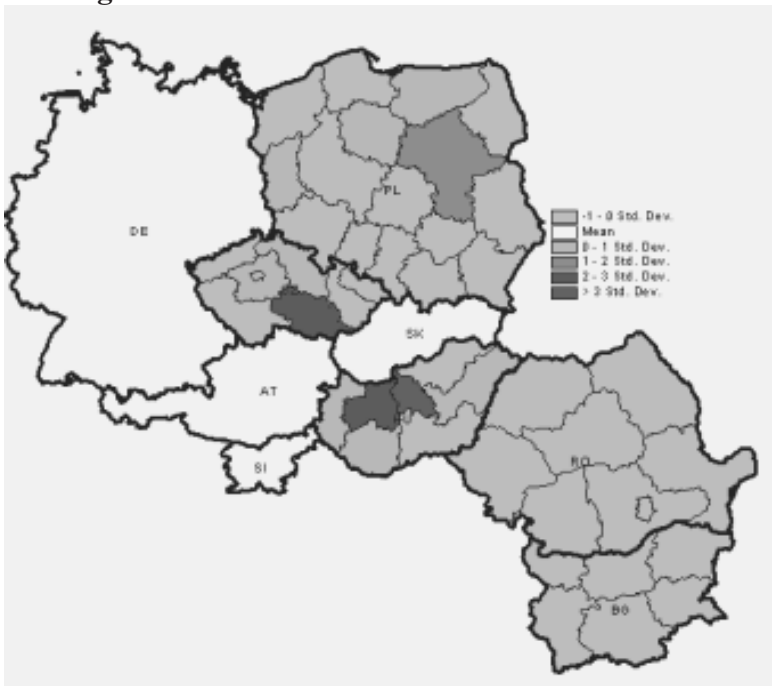
Source: Petrakos, Fotopoulos and Kallioras (2005)

A2.12: The impact of structural change on industrial GDP per capita in the New Member States and accession countries, 1991-2000

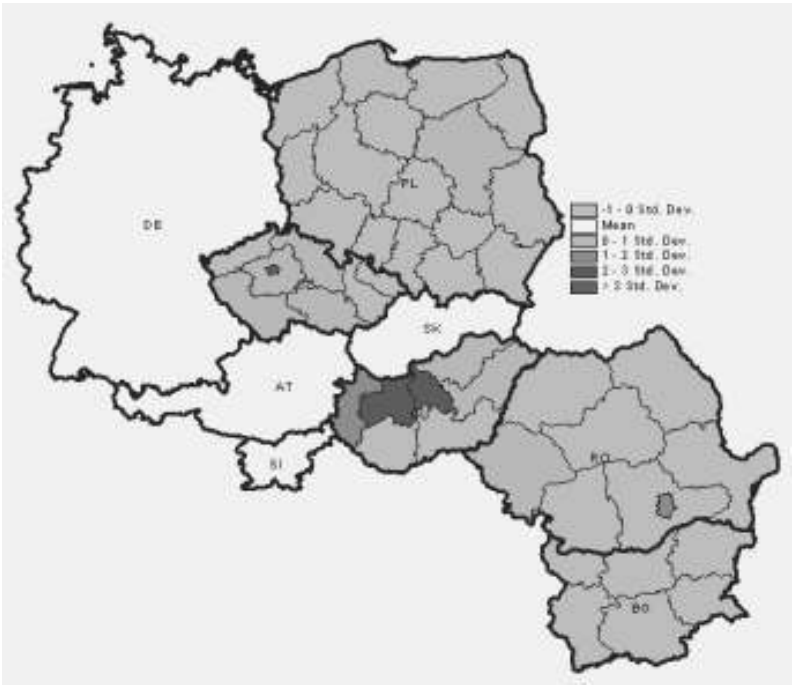


Source: Petrakos, Fotopoulos and Kallioras (2005)

A2.13: The spatial distribution of foreign firms within technology intensive manufacturing sectors in the New Member States and accession countries

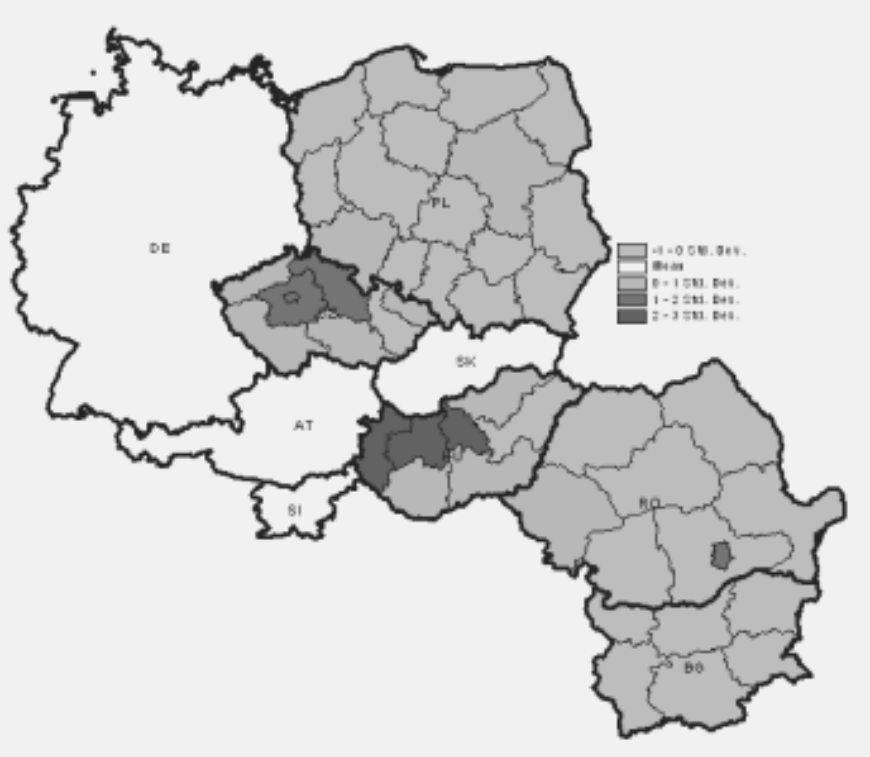


High tech sectors: 1992

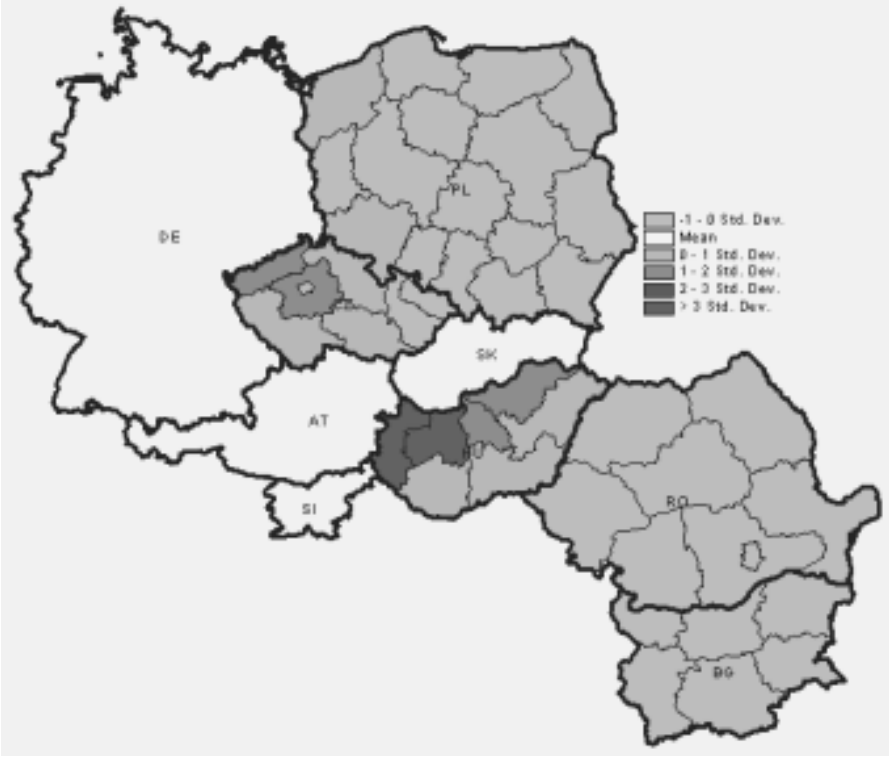


High tech sectors: 2001

Source: Resmini (2005)



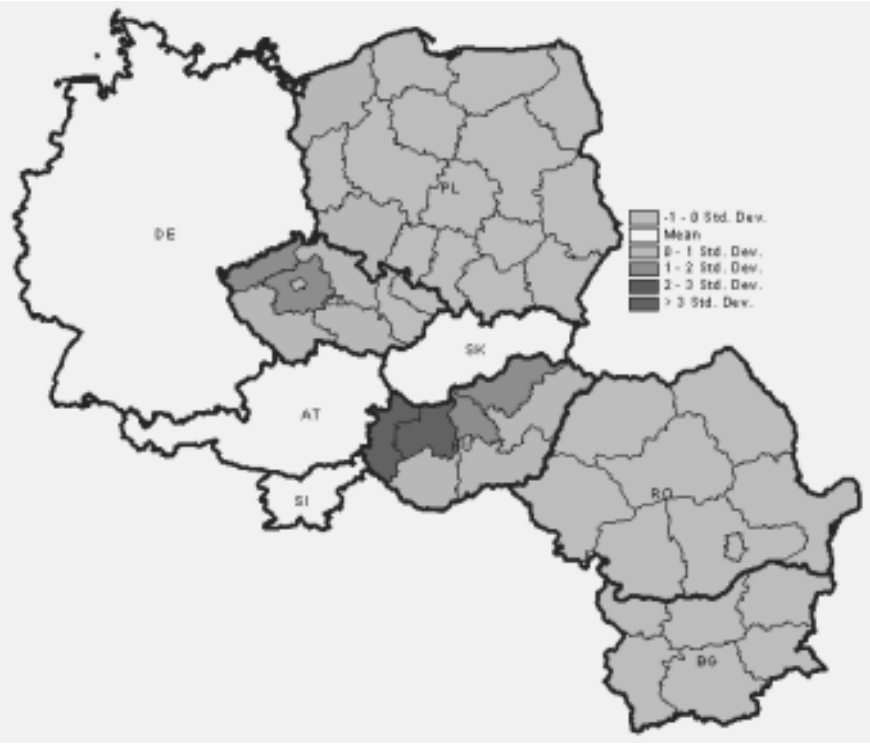
Medium-high tech sectors: 1992



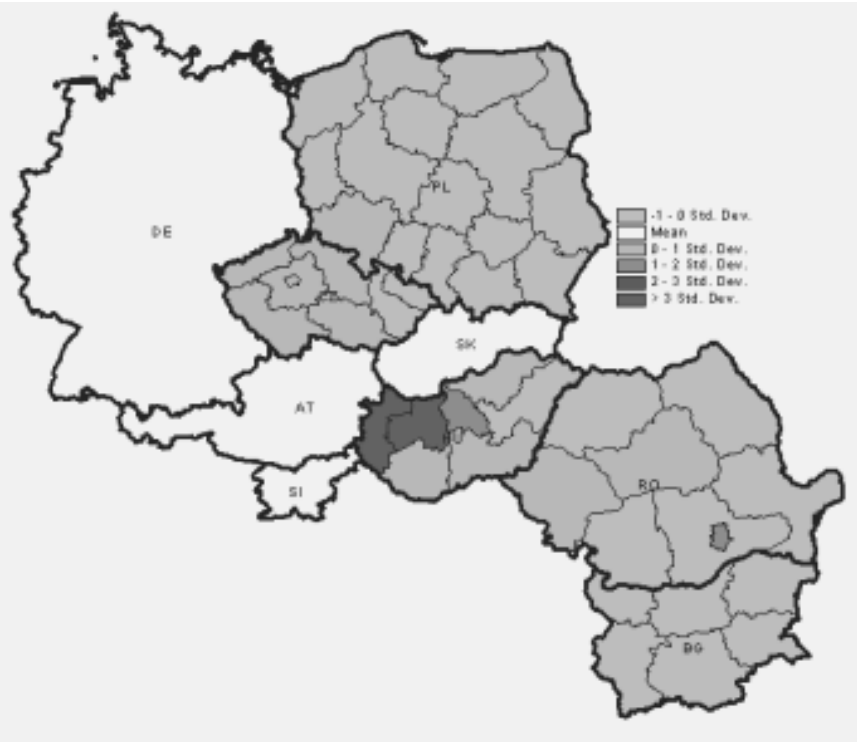
Medium-high tech sectors: 2001

Source: Resmini (2005)

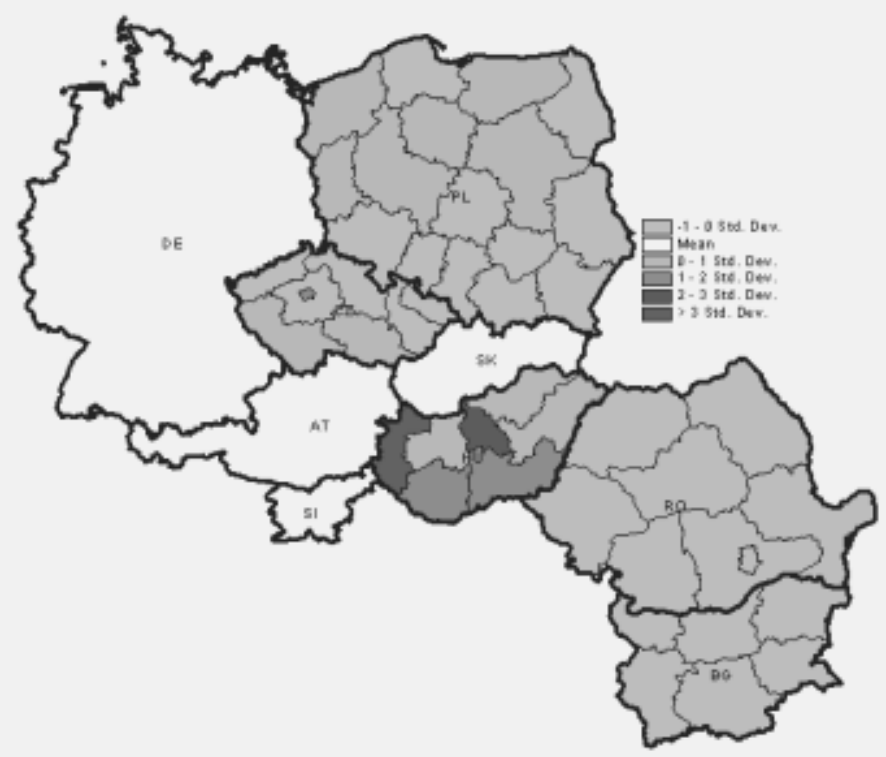
A2.14*:* The spatial distribution of foreign firms within traditional manufacturing sectors in the New Member States and accession countries



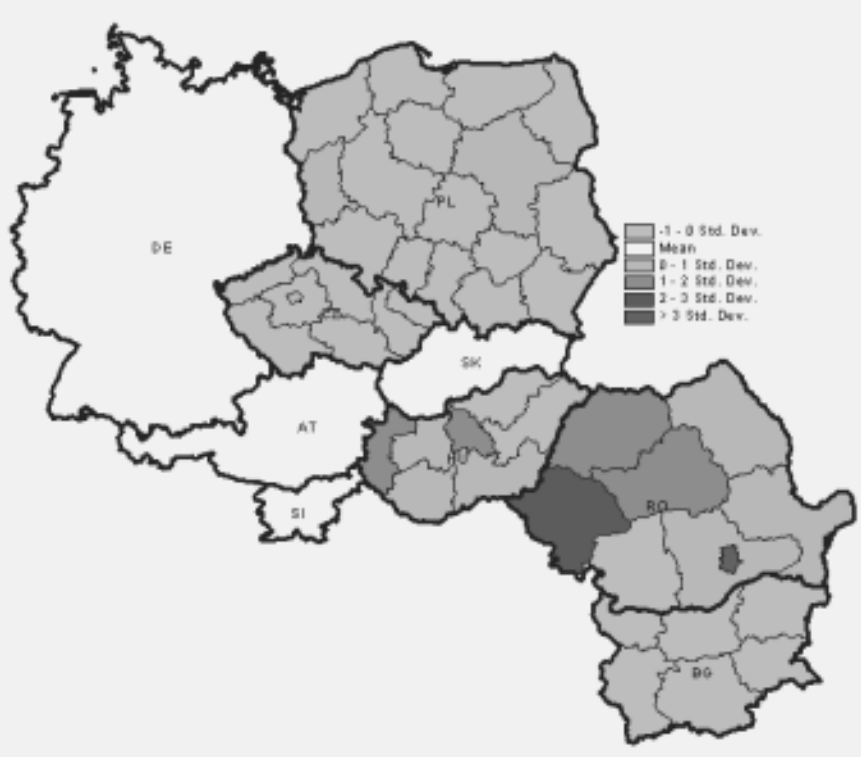
Medium-Low tech sectors: 1992



Medium-Low tech sectors: 2001 *Source:* Resmini (2005)



Low tech sectors: 1992



Low tech sectors: 2001

Source: Resmini (2005)

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