European Commission
Directorate-General for Regional Policy

Study on FDI and regional development
Final report

Report by
Copenhagen Economics in cooperation with Professor Magnus Blomström

Submitted
22 December 2006

COPENHAGEN ECONOMICS

Tel +45 7027 0740 Fax +45 7027 0741 www.copenhageneconomics.com hq@copenhageneconomics.com Nyropsgade 13, 1, 1602 København V, Danmark CVR. Nr. 25262441

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Preface

The EU Commission represented by DG Regional Policy has asked Copenhagen Economics to carry out a study entitled: *FDI and regional development* (issued in the call for tender no. 2005 CE 16 0 AT 030). This is the third deliverable under the contract.

This study has drawn heavily on the knowledge of one of the world's leading experts with a long list of publications in the field of FDI and its externalities, Professor Magnus Blomström of Stockholm School of Economics. The report is prepared by Economists Anne Raaby Olsen, Eske Stig Hansen and Martin Kyed, and Senior Economists Christian Jervelund and Martin Hvidt Thelle.

Copenhagen
22 December 2006

Summary

In this summary we provide a discussion of the link between the characteristics of regions that attract foreign investors and the amount of externalities engendered by FDI. We also discuss the impact of different types of FDI incentives on both the overall economic growth as well as in the geographical distribution of economic activity across the EU-25 plus Bulgaria and Romania.

Foreign direct investment can play an important role in raising a region's technological level, its productive efficiency and its ability to compete internationally. Foreign firms bring new technologies, new knowledge and new management skills, and local firms can learn from this. Therefore, the presence of foreign firms can improve a region's competitiveness, but fears can also be raised that foreign competitors crowd out local firms, and a net positive effect on the regional economy can not be taken for granted.

Key messages of the study
Our study finds strong empirical support for the economic benefits of FDI across all types of regions and industries:

- **Host region productivity spillovers from FDI are generally positive and significant**
  Local firms increase productivity as a result of foreign investment in their region. A productivity gain for local firms of up to 40 percent can be measured as a maximum potential. We estimate productivity spillover-coefficients in four groups of regions for nine industries (a total set of 36 analyses). We find significant positive spillovers in 24 of 36 best-fit-estimations, and significantly negative spillovers in only two of the 36 estimations. Ten out of 36 estimations show insignificant spillovers. This result is tested and found robust over a large set of different model specifications.

- **Labour demand is *not* negatively affected by FDI**
  Over time, FDI leads to more demand for labour, not less. For the same four groups of regions and the same nine industries we have modelled the effects on regional labour demand. In general, FDI lift aggregate regional labour demand, but some sector adjustments are also seen. Even though the results are slightly less robust than the productivity effects above, we find no systematic evidence of negative labour market effects from FDI.

- **FDI *is* attracted by regional policy factors**
  Most regions can improve their attraction of FDI. Analysing the location pattern of FDI across European regions, we find a number significant regional attraction factors: good infrastructure and accessibility, a highly educated regional workforce and a high level of spending on R&D attract FDI. Also good penetration of information- and communication

technologies and a large pool of competitors, clients and suppliers within the firm's industry are shown to attract FDI. However, other factors that can not be influenced at the regional level, such as firm specific conditions, national macro-conditions, market size, geography and language, are equally or more important.

- **Current pattern of FDI and current levels of host region productivity spillovers *enhance* growth and convergence at large**
  The two large groups of regions with below average regional income per capita, namely the cohesion regions and the regions in Eastern Europe, have benefited from FDI through productivity spillovers and in itself this had lead to more convergence. There are exceptions to this general pattern. We show that the remote regions in the Nordic countries, the remote parts of the British Isles and the remote Mediterranean regions are challenged to attract FDI. We also show that regions in EU15, in lack of competitiveness, do not have sufficient absorption capacity to benefit from FDI.

Thus, FDI increases regional growth and many European regions have seen benefits from attracting foreign direct investments. Our overall conclusion is therefore that FDI policies should form an integral part of regional growth policies aiming to create new employment and to promote economic growth in the regions. However, the details of how FDI is attracted make all the difference. The evidence presented here, suggests a move away from policies based on traditional regional FDI incentive packages towards policies recommending the integration of modern regional inward investment agencies into regional growth strategies aiming at informing and helping foreign investors see the potentials of their region and help the region overcome regulatory barriers.

Many previous studies have pointed to the fact that direct subsidies to attract foreign investors (such as tax holidays) tend to shift profits and welfare away from the host regions towards foreign firms and their home regions. Therefore, public funds and incentives aiming to promote regional growth through direct subsidies to foreign firms may actually be counter productive to regional growth in the lagging host regions, and may be detrimental to regional convergence in Europe.

By enhancing the local supply of human capital and modern infrastructure and by improving other fundamentals for economic growth, a region does not only become a more attractive host region for foreign firms, it also increases the likelihood for benefits from the foreign firms through the spillover mechanisms.

Therefore, in summary, our study finds strong empirical support for the pivotal role of foreign direct investment in regional growth and development in Europe's lagging regions, but the details of policies to attract foreign investors also matter.

Well-designed regional FDI policies have positive implications on the European economy, both in terms of the overall growth possibilities, and in terms of promoting regional convergence, and catching-up by the least developed regions in Europe. Ill-designed policies can work in the opposite direction.

Content of the report
This report summarises the empirical analyses carried out in the study. We aim to draw a picture of the situation in each group of regions regarding the effect of FDI. For each group of regions, we present a comprehensive analysis of (1) the factors influencing the attractiveness of regions for foreign investors, and (2) FDI impact on regional development through spillovers to local firms and the externalities on the regional economies in host regions.

The regions and the region groups in the study
Our study focuses on the regional impact of FDI, and we describe the regional growth effects from foreign direct investment in the following four groups of regions (NUTS-2 level):

- **Group 1** consisting of the NUTS-2 regions in the new EU Member States from Central and Eastern Europe plus Bulgaria and Romania;

- **Group 2** consisting of the NUTS-2 regions in other countries supported by the Cohesion Fund in the current and previous periods (Spain, Portugal, Greece and Ireland), as well as the New Länder in Germany, which are at an advanced stage in the process of modernisation in economic terms;

- **Group 3** consisting of certain NUTS-2 regions in the EU-15 experiencing problems of lack of competitiveness and increasing unemployment;

- **Group 4** consisting of the NUTS-2 regions that are remote, peripheral, insular and border regions as well as the regions in the sparsely populated areas in the Nordic countries.

The four groups are used throughout the study and the definition of the groups is provided in appendix A. The remaining NUTS-2 regions are all in EU15 and they are also included in the study and used as reference group in the estimations. The study covers 268 NUTS-2 regions adding up to the entire European Union of 27 member states (EU27).

Results in the report

We have estimated the location factors for approximately 100,000 foreign firms in Europe and the impact of these foreign direct investments on local firms[1]. We have around 2.2 million local firms in the sample representing all 268 European regions. Data covers the period from 1995-2004, but in general only the most recent data enters into the estimations. The study includes both foreign firms from other European countries and firms from outside the EU (e.g. the US and Japan). The study is thus based on an unprecedented large, exhaustive and detailed amount of firm level data taken to the regional level.

Both regional and national characteristics determine the location of FDI
Our analyses show that the location of foreign firms in Europe is guided mostly by firm specific characteristics, and that only a minor part of the location pattern can be explained by observable regional/national factors. This is no surprise. However, it is surprising that we identify some very systematic and fundamental economic characteristics of the countries and regions in which foreign investors tend to invest. We show that foreign direct investment is – in general – attracted to regions within countries that have[2]:

- Access to a large national market (national market size effect)
- Borders with the home country and/or language in common with home country (proximity and culture effect)
- A high level of business English proficiency (internationalisation effect)
- Low corporate taxes (fiscal incentive effect)
- Many advanced consumers with high purchasing power (national GDP per capita)
- Low unemployment level (proxy for few rigidities on the labour market)

[1] The data is registered according to headquarters, not individual plants.

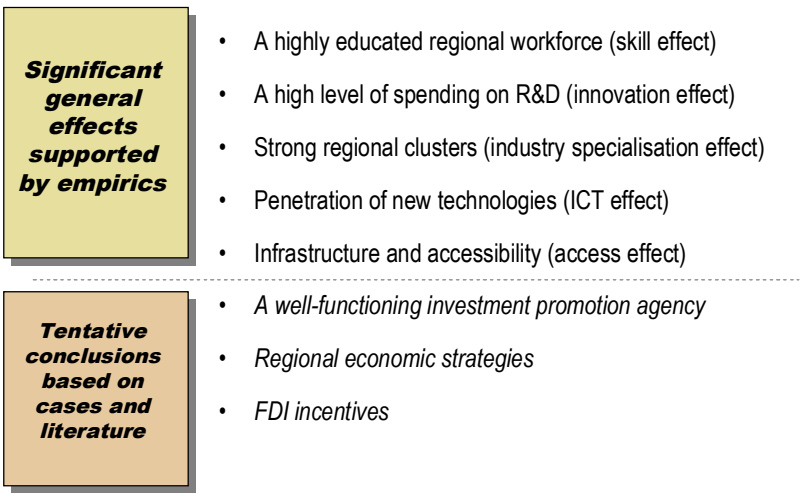
[2] The location factors are listed according to their significance in the econometric models. We thereby rank the location factors both according to the size of impact and certainty.

Given the choice of country, we furthermore show that foreign direct investment is attracted to *regions* with:

- A large share of other foreign investors (signal effect)
- Good infrastructure and accessibility, especially to home region (access effect)
- A highly educated regional workforce (skill effect)
- A high level of spending on R&D (innovation effect)
- Penetration of information- and communication technologies (ICT effect)
- A large local presence of competitors, clients and suppliers within the firm's industry (agglomeration & clustering effect)

While regional characteristics are shown to be important for the location pattern of FDI across Europe, we show that the best fitting explanatory model also includes national characteristics (such as the size of the national market, language and the national level of purchasing power). National GDP comes out as a significant explanatory variable in all estimations explaining the observed distribution of foreign ownership across Europe. The result holds regardless of industry and regardless of geographical sub-region. The lesson is that it is important for foreign firms to be present on each national European market. At the same time there are increasing examples of outsourcing to low cost regions within Europe and signs of increasing agglomeration in fewer locations in Europe for certain industries. However, the general pattern of foreign investors in our sample is not a process of large scale agglomeration in fewer locations with the purpose of serving the entire European market from there. We see a more diversified picture with many regional sub-centres across Europe, and some importance of national borders.

Figure 1 Regional policy factors for FDI



Source: Copenhagen Economics

For EU27 we find that both the level of information and communication technology (ICT) and innovation has a positive effect on attracting FDI. For the Eastern European regions this is only the case for innovation, whereas the level of ICT does not affect the level of FDI. Once again, this indicates differences in the investment structure. In Eastern Europe, the investments do not depend on the level of regional knowledge.

We will now sum up the results according to the three issues of interest for the study: The attraction factors, the technological spillovers, and the labour market effects of regional FDI.

Regional attraction factors for FDI

The first issue of interest is the **attraction factors.** Here we were asked to analyse:

- ☑ **Attraction factors:** I.e. the specific characteristics of different regions that attract FDI (strengths, potential, territorial handicaps, fiscal incentives, socio-economic, cultural and political features);
- ☑ **Sectors:** the sectoral distribution of FDI across EU-25 plus Bulgaria and Romania;
- ☑ **Geography:** discuss the issue of FDI diversion from neighbouring regions and its reasons, especially in the border areas between old and new member states.

Regarding the *attraction factors for FDI* our study has shown that:

- ➲ *Group 1*, consisting of the NUTS-2 regions in the new EU Member States from Central and Eastern Europe plus Bulgaria and Romania, has in general *attracted less FDI* than the reference group, when controlling for size. This is a result of poorer performance on the above mentioned location factors for FDI.

- ➲ *Group 2,* consisting of the NUTS-2 regions in Spain, Portugal, Greece and Ireland, as well as the New Länder in Germany, has in general *attracted more FDI* than the reference group, when controlling for size. This is a result of good performance on the above mentioned location factors for FDI, and the result for the group is mainly driven by the performance of the Irish economy.

- ➲ *Group 3,* consisting of certain NUTS-2 regions in the EU-15 experiencing problems of lack of competitiveness and increasing unemployment, has in general *attracted the same level of FDI* as the reference group, when controlling for size. This is a result of good performance on the above mentioned location factors for FDI, and the advantage of being close to large national markets.

- ➲ *Group 4*, consisting of remote, peripheral, insular, border and sparsely populated regions, has in general *attracted much less FDI* than the reference group, when controlling for size. This is a result of inherent disadvantages on the most important location factors especially due to lack of proximity to large markets.

To sum up regarding the *sectoral distribution of FDI* our study has shown that:

- ➲ *Group 1* regions are generally strongly over-represented in FDI in manufacturing and underrepresented in FDI in financial and business services.

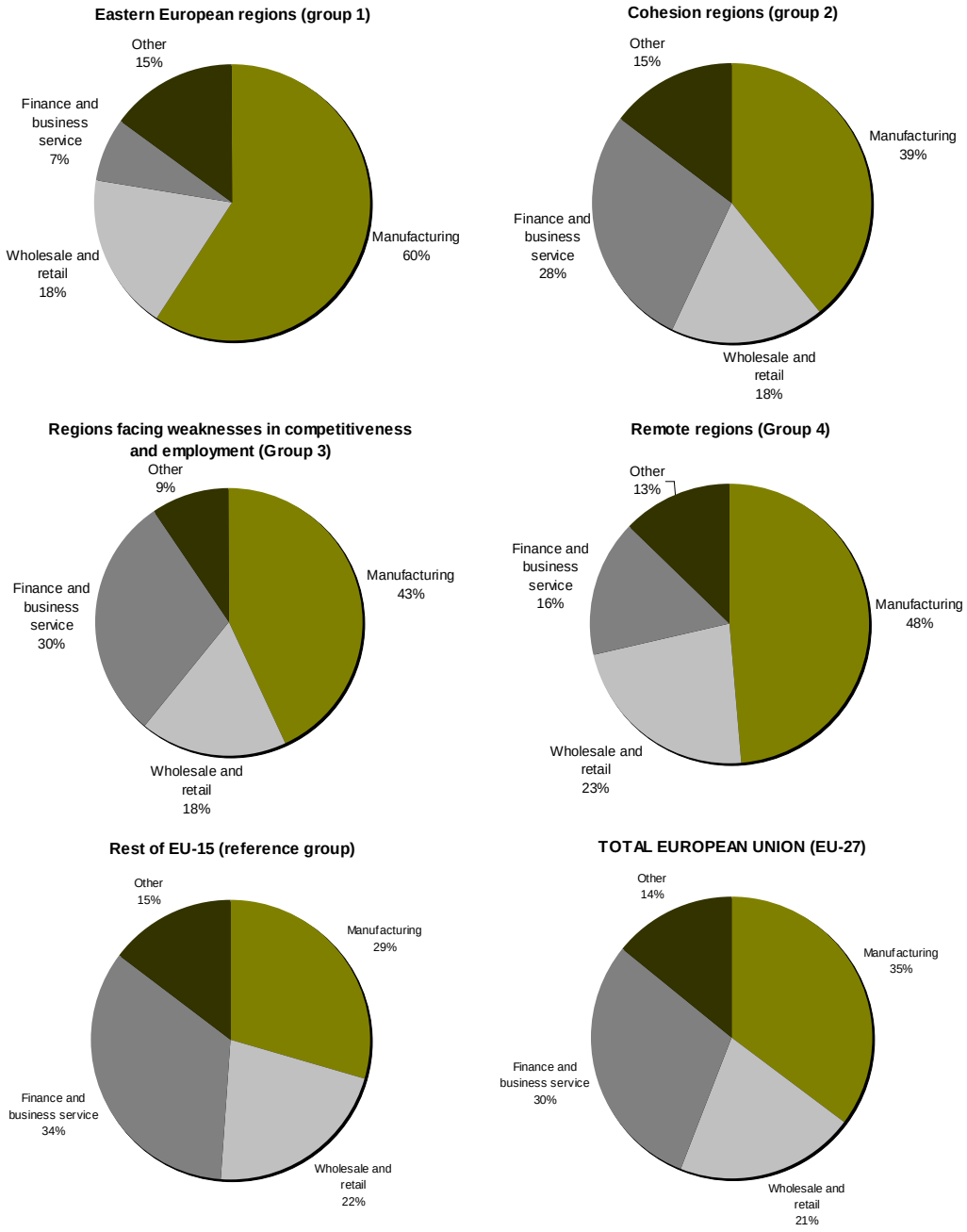
- ➲ *Group 2* regions are generally slightly over-represented in FDI in manufacturing and slightly underrepresented in FDI in all other sectors.

- ➲ *Group 3* regions are also slightly over-represented in FDI in manufacturing and slightly underrepresented in FDI in wholesale and retail as well as in the other sectors

- ➲ *Group 4* regions are over-represented in FDI in manufacturing and very underrepresented in FDI in financial and business services

Our study has also shown that the growth and employment effects from FDI differ between sectors, and therefore these sectoral differences, cf. Figure 2, have a bearing on the overall growth effects for the regions in each group. However, we can also conclude that the pattern of gains from FDI across regions is much more than just differences in the sectoral composition of the foreign firms in the region.

Figure 2 Sectoral distribution of FDI in the four groups



Source: Copenhagen Economics, own calculations based Bureau van Dijk's Amadeus database

Regarding the *geographical dimension* of FDI, we have found that proximity to the home region is an important factor in explaining the pattern of FDI across regions. Therefore, regions close to large sources of FDI tend to receive more than distant and remote regions. Furthermore, we see clear evidence that regions bordering another country receive more FDI – all other things equal – than regions inside a country. This effect is further enhanced if the two regions share a common language (as e.g. Austria and Germany, the UK and Ireland, and Sweden and Finland[3]).

[3] Swedish is the second official language in Finland.

The border between new member states in group 1 and the old EU-15 plays a special role, and FDI is overrepresented in group 1 regions close to the EU-15 borders. However, the border effect within Eastern European regions in group 1 is absent. National borders within group 1 do not have any effect on attracting more or less FDI than can be explained by the other location factors. Hence, the Eastern European market is seen as one region from an FDI point of view.

More detailed results on the attraction factors are found in the first section of the chapters 3 to 6 respectively. The sectoral and geographical aspects of FDI within each of the four groups are also addressed in the specific chapters for each region groups.

Case studies of seven regions show examples of good practice in attracting FDI and integrating the attraction of foreign firms in regional development strategies. The case studies are selected from a gross list of regions over-performing in our regressions. The case study regions are thus positive outliers (above the regression line) that perform better than predicted based on the observable regional and national factors. Many regions are above the regression line, and many more than those selected here, could be listed as good practice regions. The case study regions we selected also give a wide geographical coverage.

Table 2.1 Selected case study regions

Region group	Case study regions (NUTS-2 level)
Group 1: Regions in Eastern Europe	• Latvia (country) • Slaskie, Poland
Group 2: Regions in cohesion countries	• Southern and Eastern Ireland, Ireland • Thüringen, Germany • Mecklenburg-Vorpommern, Germany
Group 3: Regions facing weaknesses in competitiveness and employment	• Veneto, Italy • Steiermark, Austria

Source: Copenhagen Economics in consultation with DG Regional Policy

The analyses of the factors attracting FDI as well as the case studies allow us to make recommendations for regional policy on how to increase the attractiveness of regions for foreign investors. The systematic analysis of attraction factors in this study reveal that foreign investors are attracted to regions with a long term commitment to improve the underlying growth conditions by investing in education and training of skilled labour (e.g. language skills and international business understanding) and infrastructure. Furthermore, all case study regions underline the importance of having a highly professional investment promotion agency.

Fiscal incentives seem to have some importance, at least in the initial phase of attraction in both cohesion regions and in Eastern Europe. However, our case studies also show that subsidies or tax relief can hardly compete with regions investing in underlying long-term growth factors like education, research, ICT-infrastructure and good regulation fostering entrepreneurship. Furthermore, both economic theory and empirical studies warns host regions that fiscal incentives helps back-transferring some of the rents to the host economy that otherwise will result from the spill-over mechanisms. Thus, if fiscal incentives are under consideration, a relevant possibility for host regions could be to consider providing incentives to foreign investors that are just as good – and no better – than what is available for local firms.

Cluster policies and strategies seem to have some importance in attracting foreign investors, at least in group 3 consisting of regions within EU15 facing weaknesses in competitiveness and employment. Both case study regions, as well as our estimations, support the conclusion that foreign investors – to some extent – invest to gain access to the knowledge in specific clusters. The Vento case and the Steirmark case are examples of this.

Technological spillovers from FDI

The second issue of interest is the **technological spillovers**. In the discussion of technological spillovers, we were asked to distinguish between the basic transfer of know-how and the more strategic approaches realising wide ranging restructuring with a deeper and long lasting effect on productivity and growth. The analysis therefore highlights:

- ☑ the measurement of the gains arising from technological spillovers versus the effects from internal restructuring and competition within industries for the above mentioned four groups of regions;
- ☑ What effect (technological versus restructuring) dominates in the different groups of regions of the EU-25 plus Bulgaria and Romania?

Our study has estimated the net effect of the technological spillover and the restructuring effect, and we show that:

- ➲ In Eastern European regions (group 1) the estimated spillover effect is higher than the reference group. Eastern Europe gains a lot in the wholesale & retail and business services (finance). Moreover, in services sectors the spillover effect is larger than in the manufacturing sectors measured per unit of FDI. However, since the FDI in group 1 is strongly overrepresented in manufacturing the overall productivity gains in this group are mainly driven by foreign direct investment in manufacturing.

- ➲ Generally, the spillovers in the cohesion regions (group 2) are also very similar to those measured in the reference group, in terms of the estimated spillover coefficient. The econometric estimate in general has a meaningful economic size of around 0.5, i.e. that local firms are approximately 40 % more productive if they are surrounded by competitive foreign subsidiaries. We can also appoint Ireland as the biggest winner in the quest for spillovers; not only has it experienced immense FDI inflows, but also into the industries generating the largest economic benefits. Furthermore the absorptive capacity in Ireland has been substantially expanded due to investments. Also the Portuguese capital and North Spanish regions have benefited significantly from FDI. On the other end of the scale, we find Greek and East German regions; the latter probably being underestimated as West German investments have been considered domestic (and not foreign), although spillovers certainly also arise from such investments.

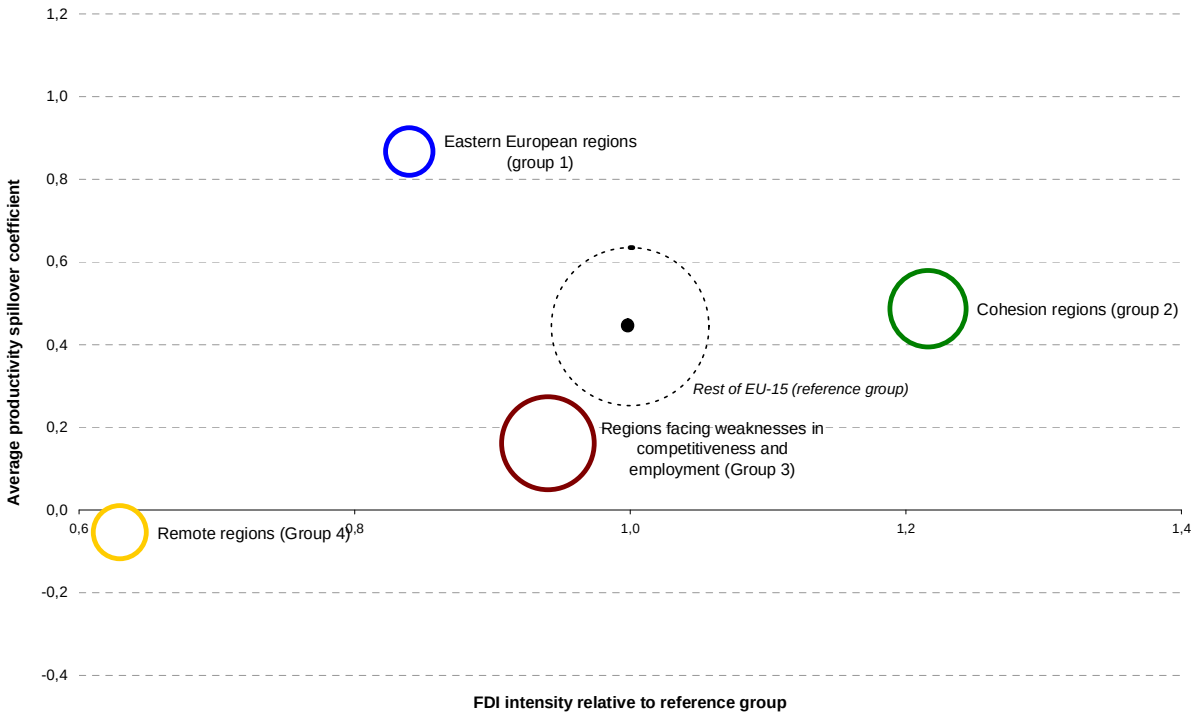
- ➲ The regions facing weaknesses in competitiveness (group 3) are much closer both geographically and economically to the countries originating the investments. Therefore, because the technological gap is smaller, we generally obtain positive spillovers in group 3, but of much smaller scale and less statistically significant than in other regions.

- ➲ In the fourth group we see little FDI (around 60 percent of average FDI-intensity) and therefore we also have a much narrower sample, and therefore results are less statistically significant. The best estimate is that these regions experience very low spillovers and maybe even negative ones.

These results regarding the second issue allow us draw a fairly clear picture of the overall productivity effects in the four different groups of regions. Eastern European regions (group 1) attract less FDI than the reference group, but the learning effects are strong. The cohesion regions (group 2) attracts more FDI than the reference group (when controlling for size), but has just about average spillovers. The regions facing weaknesses in competitiveness and employment (group 3) attracts less FDI than average, and the spillovers are slightly below average. Finally the remote regions (group 4) attracts little FDI and experience almost no

spillovers, cf. Figure 3. Beneath these results we also find several examples of industries with negative productivity spillovers, so positive spillovers from FDI cannot be taken for granted.

Figure 3 FDI-intensity and average productivity spillovers from FDI for the four region groups

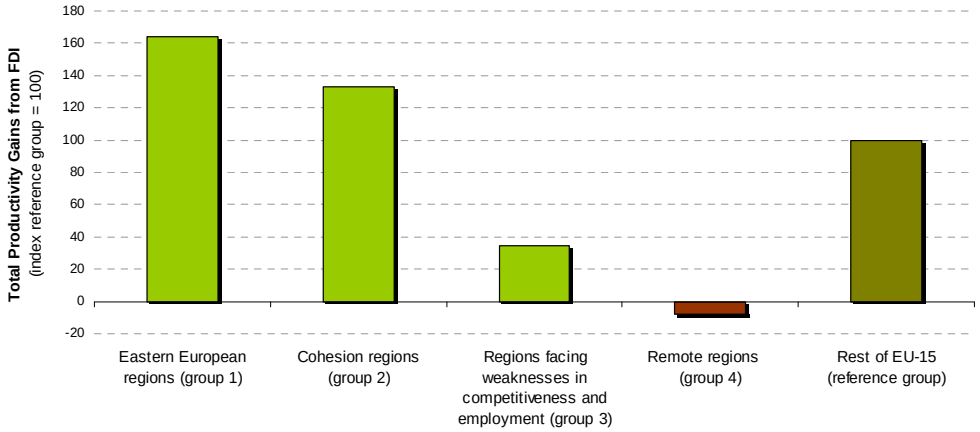


Source: Copenhagen Economics, estimations based on results in chapters 3 – 6.

Note: The horizontal axis (x-axis) shows the FDI intensity. The FDI-intensity is the share of employment in firms with 15 percent foreign ownership or more. The vertical axis (y-axis) shows the average productivity spillover coefficient across all industries and sectors. The average productivity spillover coefficient is a measure of the potential for productivity gains in the regional economy from foreign direct investments.

The horizontal axis in Figure 3 shows the FDI intensity: i.e. who attracts more FDI and who attracts less? The vertical axis shows the learning effect: who has the largest potential to learn from foreign firms? Where are the total productivity benefits the largest? To answer this, we look at the size of the spillover as represented by the econometric coefficient estimate. The estimate can be interpreted as the percentage change in the productivity of the last local firm when foreigners completely overtake the local industry. Or put more simply, the coefficient measures the maximum spillover potential. Thus, if we multiply the coefficient with the actual FDI intensity, we obtain an indicator for the total relative productivity gain from FDI.

Figure 4 Total productivity gains from FDI



Source: Copenhagen Economics, estimations based on results in chapters 3 – 6.

Generally, the total productivity gain is highest in the Eastern European regions and second highest in the cohesion regions. The gains in the cohesion regions are similar to those measured at the pan-European level. The gains in group 3 are significantly lower than in the two former groups, and significantly lower than the reference group. No significant gains can be accounted in group 4.

Since Eastern Europe and the cohesion regions are the regions with below average income per capita, the results above indicate an overall convergence trend in productivity levels as a result of the FDI in the period we analyse. In other words, without the foreign investment in these regions that we have seen during the period of analysis, and without the technological spillovers, which we estimate as being both positive and significant, the level of regional economic inequality would have been large, all other things being equal. The convergence trend in the current FDI pattern is however only partial, since as shown above, both regions facing weaknesses in competitiveness and the remote regions have less than average total productivity spillover from FDI, and are thus left further behind on this measure than before. The overall impact on productivity is still towards more growth and more convergence.

Labour market effects from FDI

The third issue of interest is the **labour market effects**. The presence of FDI, especially Greenfield investments, creates new jobs and stimulates GDP growth and employment. However, foreign firms can be expected to be quicker to lay off redundant workers, perhaps more so when acquiring an existing firm. The presence of foreign firms may force inefficient local firms out of the market which would also result in a loss of working places. We were therefore asked to quantify:

- ☑ The job creation and job destruction effects induced by FDI in different sectors.

The data we have used permit us to classify the impact of FDI on local labour markets according to the three types of investment: Greenfield investment, acquisition of existing companies and privatisation of former state owned enterprises.

We find that regardless of the type of FDI and regardless of the region groups, the long term effect from the FDI induced productivity gains on labour demand are positive. More FDI increases the international competitiveness of the region, and the total increase in output and derived demand is generally strong enough to counter-balance the lay-off engendered by the foreign owners or induced by the competitive restructuring resulting from the foreign presence. We show that foreign takeovers of local firms through mergers and acquisitions generally lead

to a period of restructuring and downsizing of the local staff. This effect is seen in all region groups and all sectors. We also see a general increase in labour demand within the regions having many Greenfield investments. Both mergers & acquisitions and Greenfield investments introduce more competition in the local industry and inefficient local firms are driven out. At the same time, productivity gains from both learning effects and from restructuring improves the competitiveness of the remaining industry and the increased demand from the rest of the economy drives up labour demand.

The net result on labour demand of all these counter-acting effects cannot be judged a priori, and the sign of the net effect depends on a number of conditions in the local labour market.

However, our empirical study allows us to estimate these effects, and we can show that the net-effect from FDI on labour demand is generally positive in Eastern Europe (group 1) and in the regions facing weaknesses in competitiveness and employment (group 3). On the other hand, we get very robust results showing that the net labour market effect in the cohesion regions (group 2) is negative. In those regions, the lay-offs after foreign takeovers and the within-industry competitive effect are stronger than the effect from induced demand from other sectors.

Figure 5 The net effects of FDI on regional labour demand

	General encountered effect on regional labour demand*
(1) Merger & Acquisitions	-
Greenfield investments	+
(2) Within-industry effect from FDI on local competitor's labour demand	-
Cross-industry effect from productivity knock-on effects	+
(3) Net regional effect	+

Source: Copenhagen Economics
Note: *) Please note that the table only shows the general encountered effect based on a very large sample of regions and foreign investments, and that the result in specific regions can deviate from this general picture.

Regarding the overall pattern of the labour market effects we see a general pattern of convergence as well. The FDI impact on labour markets is generally positive in Eastern Europe (group 1), the regions facing weakness in competitiveness (group 3) and in the remote regions (group 4), and furthermore, the net regional labour market effect from FDI is higher than in the control group. This indicates a general pattern of convergence in terms of employment effects, with the exception of the cohesion regions.

Limitations of the study

We have used an unprecedented large firm-level database to model the regional effects of FDI. While these data are surprisingly good, they are not perfect. In Box 1 below we summarize these limitations.

Box 1 Limitations to the data and methodology employed

The empirical modelling in this study is unique in two respects: FDI effects have never been analysed with such broad data coverage, i.e. so many firms from so many countries, and with a consistent setup analysing many different economic interlinkages simultaneously, e.g. technology spillovers by themselves and as influence on labour market impacts. At the same time, though, there exist a few drawbacks to the data and the chosen methodology which will limit our possibility of drawing indisputable conclusions.

First, the data only covers the time dimension only partially. In order to get FDI data over the period 1995-2004, we were forced to draw on a much smaller database than the Amadeus database. Amadeus itself only includes FDI information for the year 2004. Thus, we have been restricted in the modelling of dynamic effects.

Second, the firm-level data from Amadeus are not drawn randomly from all firms throughout Europe as the statistical models assume. Thus, it has been necessary in some situations to correct sampling biases by transforming variables using other statistical evidence, e.g. from Eurostat.

Third, for the remote regions we cannot observe any significant levels of FDI. Since statistical models are based on the *relative variation* in the data, we can easily conduct false inference due to the influence of minor factors. In fact, part of this argument applies for the analyses conducted at the group-level as long as the regions are economically similar enough. Thus, we have always estimated models including all of Europe to assure as much variation as possible and tried to compare the group-level models to this general model.

Fourth, our analyses underlie model uncertainties inherent in all econometric modelling. We cannot know, whether we have specified our equations correctly.

Besides the limitations of data, a few points need to be mentioned when interpreting the results.

First of all, regarding the effects on convergence across regions, it is important to mention that we have only estimated to the effects in the regions hosting the foreign investment. Thus, no home region effects from FDI have been estimated.

Secondly, we have been limited to a crude representation of labour market regulations (e.g. regional downside of national regulations, local soft conditions, local unions,…) and therefore the analysis of the labour market effects of FDI can be improve with better data on local labour markets.

Thirdly, little is known statistically about the nature of fiscal FDI incentives (financial support and tax holidays) and no information has been available on the effective marginal corporate tax rate for foreign firms in the study. Finally, more interesting policy recommendations could come out if systematic benchmarking of regional investment promotion agencies (IPAs) were available. We have carefully assessed these limitations in interpretation of the results.

Chapter 2 Methodology

Our methodology is designed to provide a "detailed empirical analysis of the impact of FDI in the regions of the EU-25 plus Bulgaria and Romania"[4]. Below, we first present the objectives and terminology of our methodological framework. Second, we discuss the way regional factors attract FDI, and third, we describe the host country effects of FDI.

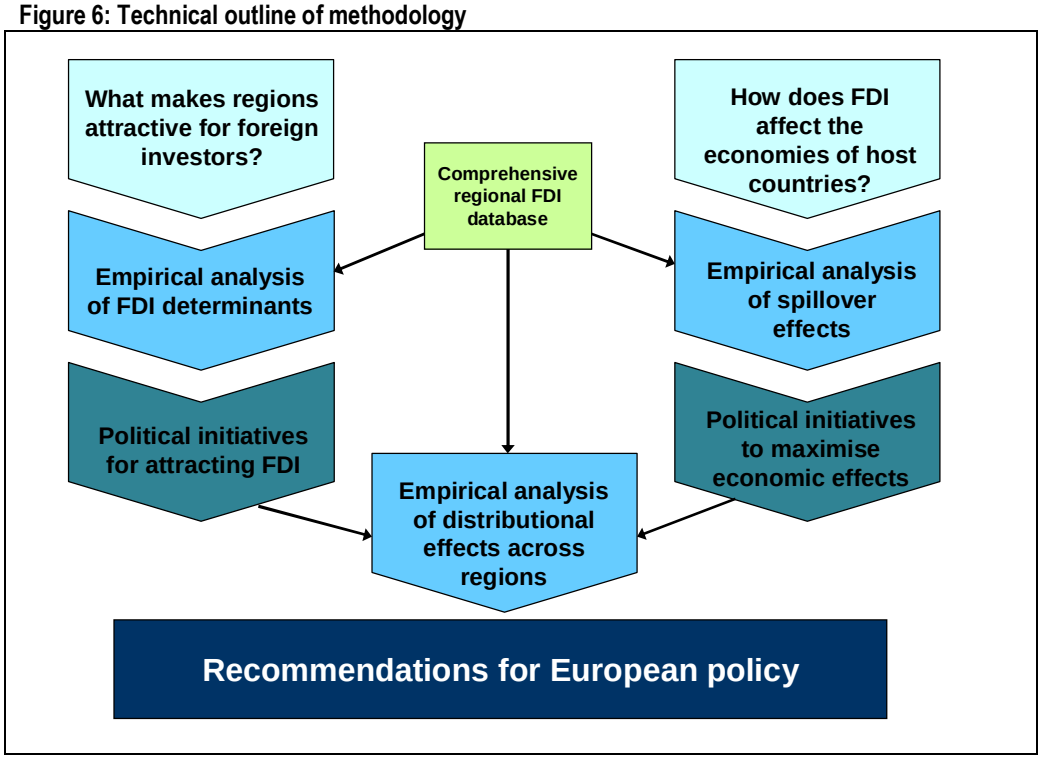
2.1. Objectives and terminology

There are three main issues of interests in this study. The first issue of interest is the **attraction factors**. Here we were asked to analyze the specific regional characteristics that attract FDI (market size, territorial handicaps, fiscal incentives, socio-economic, cultural and political features). The second issue of interest is the **productivity spillovers**. We measure the gains arising from FDI in terms of economic productivity for different groups of regions. The third issue of interest is the **labour market impacts**. We quantify the job creation and job destruction effects induced by FDI in local and foreign firms together with an overall regional assessment.

To analyse these three issues, we have set up a consistent methodology with two main pillars, c.f. Figure 6. The right pillar concerns the first issue, attraction of FDI, and the left pillar the productivity spillovers to local firms and the impacts on local employees. The analytical framework is consistent in the way that the same approach is used on all four groups of regions (as defined in Appendix A). Also, we look at the logical dependence within each pillar, e.g. between productivity and labour market effects, and between pillars. Finally, the framework is consistent in its application of data as all estimations are based on the same data source.

[4] As described in the call for tender no 2005 CE 16 0 AT 030, page 4.

Figure 6: Technical outline of methodology



Source: Copenhagen Economics

The analysis of factors attracting FDI has been conducted in a single model setup, although it consists of several separate econometric analyses. The right pillar, on the other hand, consists of several model setups each applied for several sectors and regions separately. In Table 2.1, we provide an overview of the different model setups for analysing the economic effects on host countries (the right pillar).

For both productivity and labour market effects, we have conducted analyses on two levels: the industry level and the regional level. Productivity spillovers are most likely to exist within the industry, while forward and backward linkages to the foreign subsidiaries imply more general spillovers to the rest of the regional economy. For the labour market effects, it is natural to start at the most concrete level – foreign firms themselves – and then expand the analyses to include more and more firms thereby ending at the overall regional effects.

Table 2.1: Empirical modelling of host country effects

		Productivity	Labour market
Industry-specific effect	Foreign firms	-	M&A model
	Local firms	Productivity spillovers	Labour effects within industry
Overall regional effect	All firms	Spillovers through backward and forward linkages	Regional labour demand effects

Source: Copenhagen Economics

Sections 2.2 and 2.3 give an overview of the methodology for analysing each of the three issues, and technical methodological details are given in Appendix C.

2.2. What makes regions attractive for foreign investors?

In the first part of the analysis we investigate why and how certain regions attract more FDI than others. The core of the analysis is an econometric location choice model that has a set of regional characteristics to explain the location of foreign firms. Since the econometric models cannot explain all the location decisions, we also draw on case evidence.

We have used a so called discrete choice model.[5] To match the decision structure of real-life foreign investors, we estimate models both on a national and a regional level. In other words: we assess whether a company directly chooses a specific region or the company starts by selecting a country and then the region within the country. Furthermore, we explore how firms' choice of location (in different groups of regions and different sectors) are affected by different national and regional characteristics.

Common to all models in this section is that the variable to be explained in this model is

- the firms' choice of region

This is explained by the following factors:

Regional and national characteristics

- market size
- host country's development level
- agglomeration (localisation and urbanisation)
- share of foreign direct investment
- taxes
- infrastructure, accessibility and proximity to home region, capital dummy
- skills
- unemployment rate
- language in common with host region
- level of innovation and ICT

Case studies and best-practice examples

In the best-practice analyses, we depart from the econometric models. As the location choice model is supposed to explain all the main determinants for attracting FDI, we investigate regions that have high levels of FDI not explained by the model. Technically, the selected regions are regions with a large difference between predicted and actual FDI, i.e. with large positive residuals. Thus our strategy is to investigate the regions with the highest *unexpected* FDI inflows. In this way, we assure that the best-practice analyses not only replicate our econometric results, but contribute with independent information.

For each group of Eastern European regions, Cohesion regions and regions facing weaknesses in competitiveness and employment we have selected two regions that have experienced unexpectedly high FDI. For the remote regions, we make one general "case study" focusing on the specific problems in these regions.

The regions are investigated thoroughly to shed light on the determinants of the high degree of attractiveness. This is done by interviews with the regional investment agency – and in some cases with firms having actually invested in the region – together with a detailed literature review.

[5] More precisely a conditional logit model.

2.3. How does FDI affect the economies of host regions?

This task is devoted to exploring the effects on the host regions. That is, we are simply asking the question: How are regional economies affected by FDI inflows? We consider effects on both firms (in terms of productivity spillovers) and individuals (in terms of employment). This study is unique in two respects: first, it covers far more regions, sectors and firms than any previous study of its kind; second, it is the first study to investigate spillovers to labour markets on solid quantitative grounds.

Productivity spillovers

The notion of productivity spillovers refers to the transfer of technical and managerial knowledge (productivity) from foreign owned firms to local firms. In the quantitative economic model, we seek to identify whether such knowledge transfers exist from FDI in the EU Member States.

By setting up an empirical model explaining firm level productivity using an extraordinarily large company-database, we analyse the spillover effects from foreign to local firms. The model chosen is used extensively in the empirical literature of productivity spillovers.

In an informal language, the econometric exercise boils down to comparing local firms in industries with high levels of foreign investments to other local firms from industries without any significant foreign investments; if the former is more productive, we say to have found evidence of spillover effects.[6]

More formally, we set up econometric models where productivity will be explained by factors like:

- use of capital
- use of labour
- firm age
- geographic location
- comparative advantage (inter-sectoral concentration of industry)
- FDI at the regional and sectoral level

Here, the latter explaining factor, "FDI at the regional and sectoral level", will allow us to measure the productivity spillover from foreign to domestic firms. The model has been applied to a wide range of subsamples, e.g. different sectors and different geographical areas in the quest to get a thorough understanding of the size and distribution of spillovers. The models have a high degree of explanatory power.

Empirical model of labour market impacts

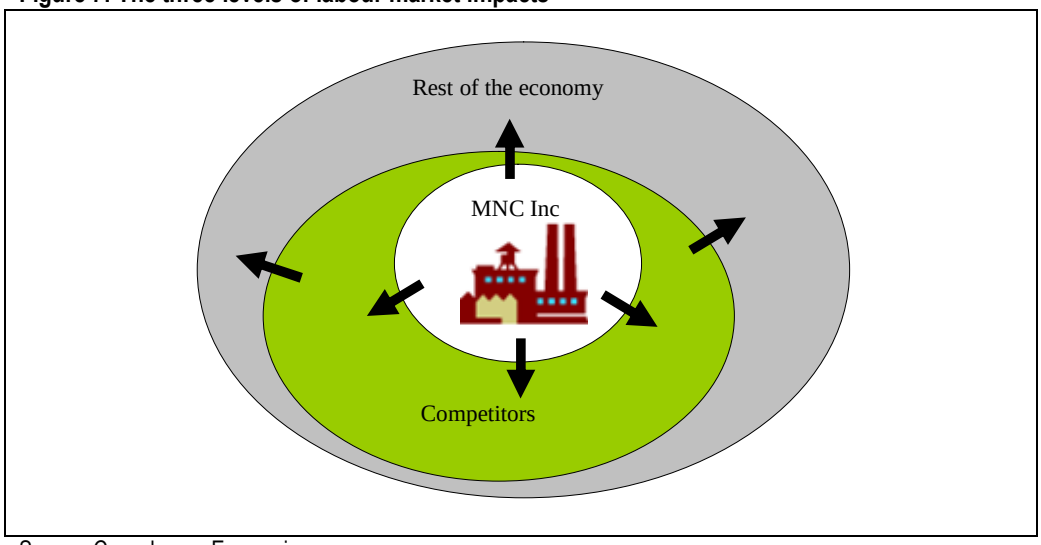
Whereas productivity spillovers have been subject to a number of empirical investigations, no serious attempts to unravel the impacts from FDI on labour markets have been made up to this date (according to our knowledge). We have taken up the challenge, and through a number of empirical models, we give a detailed picture of how firms adjust their labour demands when foreign investors enter the region.

There is a number of ways through which foreign investments can influence the labour demand. There will be direct effects on the newly established affiliates, and there will be indirect effects on the local firms as they are exposed to more qualified competition. Finally,

[6] It could be questioned whether such models induce a correct interpretation of the causality between sectoral productivity and sectoral FDI inflows. Possibly, FDI could be more intensive in sectors with high productivity simply because of the high productivity. Due to this reason, we include a measure of sectoral comparative advantages; the variable potentially corrects for this kind of investment incentives.

there will be knock-on effects on the rest of the economy if the industries experiencing much FDI manage to increase productivity and thereby produce more output to lower prices, cf. Figure 7.

Figure 7: The three levels of labour market impacts



Source: Copenhagen Economics

In the empirical modelling, we will start with the newly established affiliates. We have to distinguish between on the one hand greenfield investments and on the other hand mergers and acquisitions. As the former implies setting up an entirely new plant, local labour demand can only increase, but already existing firms (the situation with mergers and acquisitions) could potentially be restructured after the takeover which would have ambiguous effects a priori on the labour demand. Due to this, we set up a dynamic model investigating the pattern of job destruction and job creation in firms being merged or acquired by foreigners.

Secondly, we set up a model analysing the indirect effects on local firms within the industry (local competitors). The model combines standard labour demand specifications with the impact measurement from the productivity model. Indeed, this model has a similar interpretation, except that we are focusing on labour demand impacts, not on productivity spillovers.

Finally, we extend the within-industry model to include more aggregated effects from FDI. That is, we intend to measure not only the effects on the specific firm and its competitors, but on the entire regional economy. Since our sample is very extensive, we can still rely on firm level specification where labour demand now also will be determined by the regional level of FDI.

The models share some common components. Most importantly, all three models specify labour demand as a function of:

- wages
- potential output
- firm age
- geographic location
- comparative advantage (concentration of industries)

Depending on the kind of firms under investigation – affiliates vs. local firms – we also include an adequate variable capturing FDI. The next chapters are applications of the mythology explained in this chapter.

Chapter 3 FDI in Eastern Europe

This chapter presents the results of our empirical analysis on FDI flows and their impact on the regional economies in Eastern Europe. We consider two sides of FDI; first we investigate why FDI is allocated to a region, second we examine how the region is impacted by FDI. [7]

Our empirical investigations show us that FDI in Eastern Europe is mainly driven by the incentive to produce manufacturing goods at cheaper levels without incurring too high transportation costs of delivery to the large Western European markets. For this reason, FDI is concentrated in the regions closest to Western Europe. At the same time, we measure large productivity spillover effects due to sizeable restructuring of both firms and industries, and these benefits are transformed to more jobs at the overall regional level.

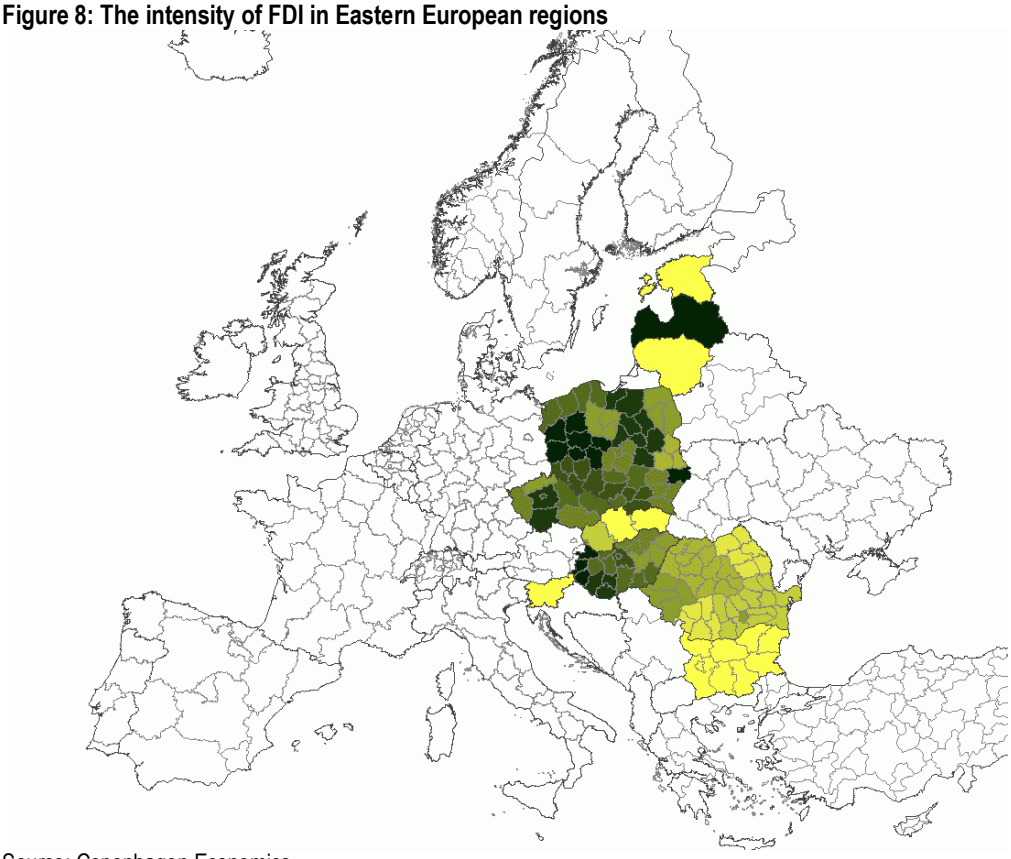
The basis for most of our empirical investigations is a database of companies with detailed ownership information. We have used this to generate a valid measure of the FDI-intensity in each region for the year 2004.[8] Data has been cleaned in order to focus on the economically interesting investments – those with a true purpose of *managing* the foreign firm.

Looking at the distribution of FDI across Eastern Europe, there seems to be clear evidence that the regions closer to Western Europe obtain the larger share of FDI. Western regions in Poland, the Czech Republic, and Hungary have higher FDI-intensities than the eastern parts of Eastern Europe, c.f. Figure 8. The only exception from this pattern would be Latvia with a very high FDI-intensity despite its distance to the richer areas of the European economy. The somewhat low value in Slovenia may be due to limited data availability.

[7] FDI includes privatisation revenues.

[8] We measure the FDI-intensity as the total number of employees in foreign firms divided by the total number of employees in the region. Appendix B describes the database.

Figure 8: The intensity of FDI in Eastern European regions

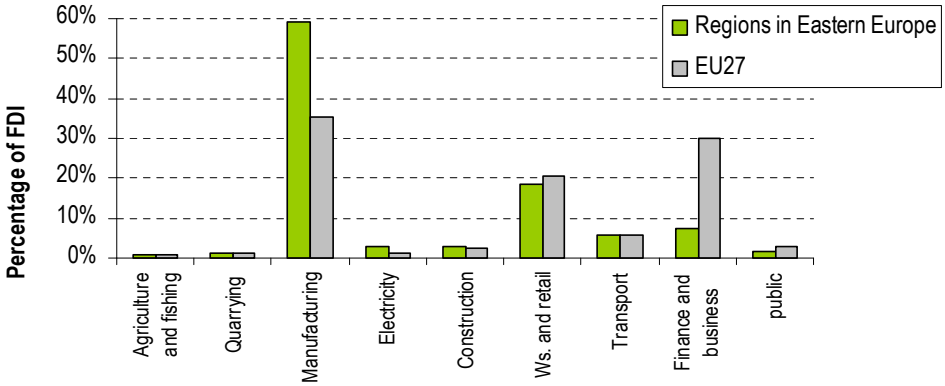


Source: Copenhagen Economics
Note: The map shows the intensity of FDI measured as the number of employees in foreign firms to total employees in the region. The darker green colour corresponds to higher FDI intensities.

We also illustrate the sectoral distribution of foreign investments, c.f. Figure 9. Throughout EU27 [9], FDI is more or less equally divided between manufacturing and the finance and business sector. In Eastern Europe, FDI is much more concentrated in manufacturing; almost 60 per cent of total FDI can be found in this sector and a far smaller share than the European average is observed in the area of business services.

[9] EU27 is EU25 plus Romania and Bulgaria.

Figure 9: Distribution of FDI by sector

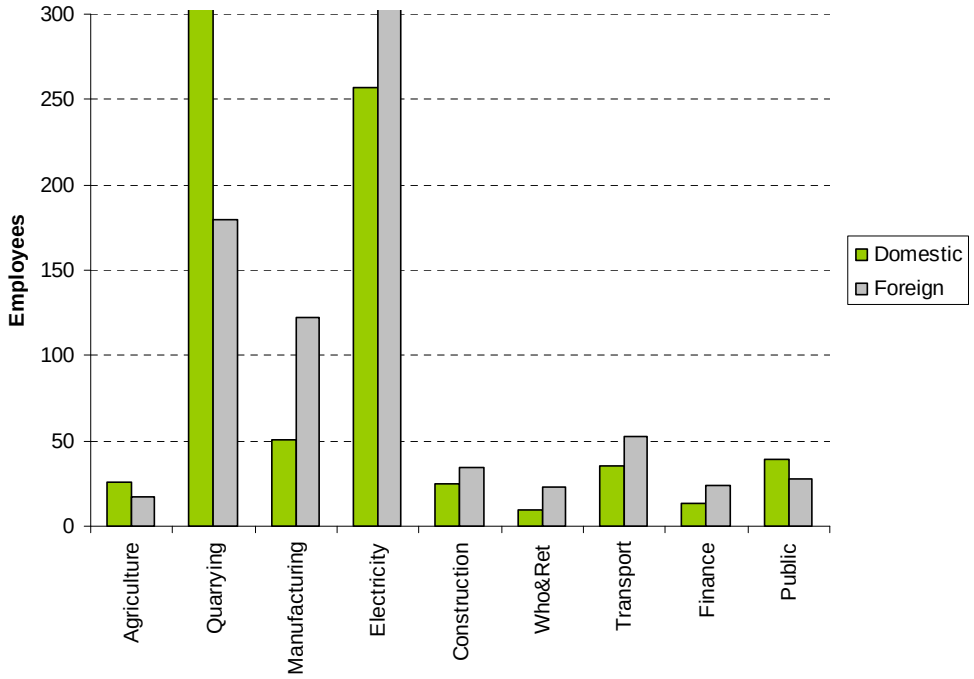


Source: Copenhagen Economics and the Amadeus database

The geographical and sectoral distributions indicate the typical kind of foreign direct investments: goods-producing plants delivering to the Western European markets with the lowest possible costs of transportation.

Turning to a micro perspective, we can describe the foreign subsidiaries more precisely. Especially, it is interesting to understand how large the foreign subsidiaries are in comparison with their local counterparts. We have calculated the average firm size of foreign and domestic firms across industries, c.f. Figure 10. Clearly, foreign firms are somewhat larger, especially in the sector attracting the largest share of FDI, manufacturing. This is far from surprising, as multinationals often seek to exploit economies of scale and to gain a dominant position in the market.

Figure 10: The size of foreign and domestic firms across sectors



Source: Copenhagen Economics

In the following, we present the results of our econometric modelling. First, we consider the factors and regional characteristics attracting FDI; second, we investigate how FDI have led to productivity spillovers; and third, we account for the labour market impacts of FDI.

3.1. Attracting FDI to Eastern Europe

EU regions have large differences in national and regional characteristics, but can these differences help understanding the foreign firms' choice of location? We try to answer this question in the following.

In this quest, we attempt to account for the factors that make regions more attractive to foreign direct investment. This is not an easy task since each new investment conceals a range of different motivations and each motivation is uniquely related to the regional characteristics. For example, some investors put more weight on the presence of low labour costs while others are more interested in skilled labour. Therefore, if we use the wage (or productivity level) as a factor to attract FDI, it will have both positive and negative effects depending on which investor you ask. In order to measure the influence from wages correctly, one would have to divide the sample according to the motivations of each investment.

Unfortunately, there is no elegant way to subdivide a sample of foreign investments along these lines without it being pure data-mining. But other aspects of the decision structure for choosing the most fortunate location can be incorporated in the empirical analyses.

Our empirical investigations have established that foreign investors choose their locations through a series of considerations. First they choose the country to locate in on the basis of certain national characteristics, and thereafter they look for the region with the most favourable characteristics within the chosen country. In the following, we split up the choice of location into these two steps in order to mirror the decision structure of real-life foreign investors.

Attracting FDI at the national level

Here, we focus on the national level, i.e. what affects the firms' choice of country? We have conducted a very large number of estimations and obtained robust results. Table 3.1 shows how different factors have a positive or negative effect on the inflow of FDI for two models, both of them including all of EU27 and all sectors in the economy. Model 1 is the general model and model 2 takes a deeper look into differences between the Eastern Europe countries and the rest of EU27. Plus and minus in the table should be read as effects "pulling" respectively "pushing" foreign direct investment to a country. An insignificant effect means that a given variable have no important effect on attracting foreign direct investment.

Table 3.1: The effect of national characteristics on attracting FDI

Explanatory variables	*Definition*	*EU27 model 1*	*EU27 model 2*
National market size	National GDP in latest available year (source: Eurostat)	+	+
Level of development	National GDP pr capita in latest available year (source: Eurostat)	+	+
Differences between Eastern Europe and the rest of EU27	Dummy variable: take the value one if a country is placed in Eastern Europe and zero otherwise		+
Specific effect for Eastern Europe countries of national market size	National GDP if country is placed in Eastern Europe, zero otherwise		-
Specific effect for Eastern European countries of the level of development	National GDP pr capita if country is placed in Eastern Europe, zero otherwise		ins-
Corporate tax	The national standard rate of taxation on corporate income (source: European Commission)	-	-
Proficiency in English	Percentage of population that speak English (source: Eurobarometer)	+	+
Unemployment rate	National unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-	+
Countries with related languages	Dummy variable: takes the value 1 if language of host and home country are the same for some part of the countries; zero otherwise. See appendix B for further information	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant

For detailed estimation information see Appendix C Stata output 1. The dependent variable is the host region of FDI

We start by explaining the results of model 1 to get an understanding of overall EU27 results. We find that *national market size* of the host country is a very important factor for attracting FDI. Including national market size, the model explains 17 per cent of the variation in location choices, but the explanatory power drops to 8 per cent if we eliminate the market size proxy. This is clear evidence that the size of the national market is essential when multinational firms choose their location in the EU27. Said in another way, a firm chooses a particular country because it wants to get into a given, sizeable national market.[10] It is likely that the enforcement of the internal market eventually will change this pattern by making national markets less important, but the current data suggests that there is still some way to go.

[10] We have done the same on regional data but the regional market size does not affect the choice of region in the same way as on a national level.

Additionally, we find that a higher *national level of development* increases the probability of attracting FDI. The national level of development is a proxy for the level of wealth and purchasing power, but could also capture better infrastructure, a skilled or educated labour force, etc.

A high level of corporate *tax* rate leads to less foreign direct investment in a country. Lowering the corporate tax rate improves the general conditions for companies and thus more FDI is attracted.

A high level of *English* language skills attracts foreign direct investment as well. This can be related to the fact that many multinational companies use English as their in-house business language as well as the fact that many foreign direct investments from outside Europe are American.

If *host and home countries have related languages,* firms are often more inclined to invest. This indicates the fact that communication between a parent company and the subsidiaries abroad (or communication in general) is important for the daily conduct of business. The variable may also capture cultural proximity as well. Table 3.2 illustrates the effect of bordering regions on a national level. Countries tend to invest more in a country near to home than in countries far away. Also the case of Romania with Italy as its main investor is a good example of how language similarities may impact location choices.

Table 3.2: Who invests in Eastern European regions?

	The four most common home countries of investors			
Host country	***Rank 1***	***Rank 2***	***Rank 3***	***Rank 4***
Bulgaria	*Germany*	*Greece*	*Italy*	*Cyprus*
Czech Republic	*Germany*	*The Netherlands*	*Austria*	*France*
Estonia	*Finland*	*Sweden*	*Germany*	*The Netherlands*
Hungary	*Germany*	*Austria*	*The Netherlands*	*Italy*
Latvia	*Finland*	*Germany*	*Denmark*	*Sweden*
Lithuania	*Estonia*	*Finland*	*Sweden*	*Germany*
Poland	*Germany*	*France*	*Sweden*	*Great Britain*
Romania	*Italy*	*Germany*	*Hungary*	*Austria*
Slovakia	*Germany*	*The Netherlands*	*France*	*Austria*

Source: Copenhagen Economics

Note: Slovenia is omitted due to a low number of observations. The largest investor (number of firms) is placed next to the host country, then the second largest and so on.

Furthermore, countries with a low *national unemployment rate* attract more foreign direct investment. This is probably the case because a high unemployment rate indicates strong rigidities in the labour market, and foreign investors tend to prefer more flexible labour markets.

Considering all of Europe together, our model results are both economically and statistically robust and reliable, but do the explanatory factors have the same effect on Eastern Europe as in the rest of EU? In order to examine this, we test whether the overall conclusion applies to Eastern Europe as well. To analyse how the determinants for foreign direct investments differ between the Eastern European member states and the rest of EU, we separate the effects specific to these countries, c.f. Table 3.1, model 2.[11]

[11] Model 2 incorporates only specific Eastern European effects for two explanatory factors; market size and development. This is the result of a testing procedure, where all factors were allowed to have different effects for Eastern Europe, but showed up not to have so.

We find that national market size has a significantly smaller effect in Eastern European countries compared to the rest of EU (cf. the effect of *Specific effect for Eastern European countries of national market size)*. To evaluate the overall effect of market size for Eastern Europe, we add the positive average European effect of *national market size* with the negative Eastern Europe specific effect, and find the overall effect for Eastern Europe to be insignificant. This is probably related to the fact that investors are more interested in low labour costs in these regions rather than investors selling to the local market. This assertion is also backed up by the high share of foreign direct investment in manufacturing, cf. Figure 9.

Furthermore, we investigate a potential difference in the effect of the development level. We find that the effect of the national level of development is not significantly different for Eastern Europe compared to the rest of EU *(Specific effect for Eastern Europe countries of the level of development*). In other words; the likelihood of attracting FDI increases with the level of development for all European countries.

Finally, we check whether there is a difference between the Eastern Europe and the rest of EU which is not a consequence of differences related to market size and level of development (*Differences between Eastern Europe and the rest of EU27)*. We find that the countries in Eastern Europe attract more foreign direct investment, when we take out the effects of differences in level of development and market size. This has to do with the facts that immature markets and high growth rates mean new market opportunities for foreign investors, and low labour cost compared to the rest of EU27 attract foreign investors producing goods for export.[12]

[12] The reader may record that Eastern Europe had a below-average FDI-intensity in **Error! Reference source not found.** and therefore may be puzzled by the fact that the econometric analysis suggests an above-average attraction effect. There are two reasons why this occurs. First, the intensities in Figure 2 are based on employees in foreign firms, whereas the econometric models simply look at the number of firms, so a general tendency towards smaller foreign firms in Eastern Europe than in Western Europe could account for part of the difference. Second, the above-average effect is measured after other factors have been controlled for, and if these other factors generally tend to lower the attractiveness of Eastern Europe, the two results may not be that different in the end.

Box 2. Factors attracting FDI – seen from the desk of the chief executive officer (CEO)

Econometric models of location choice using firm level data give well-founded empirical evidence of the factors attracting FDI since the estimations are based on actual choices. Unfortunately, though, the models fall short of explaining the factors for which no data exists. One way of assessing such factors is to see how CEOs respond in surveys asking for their motives behind foreign investments. The LOCOmonitor surveys are leading in this field.[1]

In Table 3.3 we find the results of the LOCOmonitor survey. Business executives consistently cite market potential and skilled workforce availability at the top of their list when choosing a region or country. Also industry clusters and business climate generally have high priority among business executives. At the same time, we find differences in priorities when choosing to locate in Eastern Europe compared to Western Europe and the US. Most importantly, low costs in Eastern Europe are still a driving force behind inward investments, whereas e.g. proximity to customers and inward investment agencies (IIA) are more important in the two Western areas.

Table 3.3. Motives for investing abroad, 2002-2005 (rank).

Motive	Eastern Europe	Western Europe	USA
Market size / Growth potential	1	3	2
Skilled workforce availability	5	1	3
Proximity to customers	7	6	1
Industry cluster	8	7	4
IIA or Govt support		2	7
Low costs	2		8
Regulations or business climate	6	4	
Universities or researchers	4	10	9
Finance incentives and taxes		5	6
Presence of suppliers	3		
Infrastructure and logistics		9	5
Language skills		8	
Attractiveness / Quality of life			10

Source: LOCOmonitor survey.

In a globalised world, having the right kind of people seems to be of major importance for economic success. In fact, most all of the factors that seem to concern investors can only be promoted through lasting, growth-enhancing policies. That is, local governments seem to gain much more – at least in the long run – by committing to activist policies for promoting education, entrepreneurship, and physical and social infrastructure.

[1] LOCOmonitor can be accessed at http://www.locomonitor.com/index.cfm

Attracting FDI at the regional level

Next step in the analysis is to investigate how regional characteristics affect the ability to attract foreign direct investment. We eliminate the national effect (by use of econometric techniques) to be able to compare regions from different countries. We have applied the same modelling technique of explaining location choices, but the basis of comparison is now the regional level. Due to this change in focus, we include a slightly different set of explanatory factors that better reflect the issues raised by executives when choosing a region within an already chosen country. The results of this exercise can be found in Table 3.4.

Table 3.4: The effect of regional characteristics on attracting FDI

Explanatory variables	Definition	EU27	Eastern Europe
Regional level of development	Regional GDP pr capita in latest available year (source: Eurostat)	+	+
Regional unemployment rate	Regional unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-	ins+
Capital city region	Dummy variable: takes the value one if a capital city is placed in a region and zero otherwise	+	+
Regional industry clustering	Regional location quotient for each specific industry, measured as relative share of a specific industry in the region compared to the national share	+	+
Share of foreign direct investment	Share of foreign direct investment by region and industry	+	+
Regional monopoly structure	Herfindahl index: - high value: few firms and no competition - low value means many small competitors	-	-
Border regions	Dummy variable: takes the value one if the region is a bordering another country in EU27	+	+
Tertiary education	Share of regional labour force with a tertiary educational level (source: Eurostat)	+	ins-
Secondary education	Share of regional labour force with secondary educational level (source: Eurostat)		+
ICT	Share of firms with their own website	+	ins+
Infrastructure	Traffic in commercial airports	+	-
Innovation	Total R&D expenditure (share of GDP)	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.
For detailed estimation information see Appendix C Stata output 2

For both EU27 and Eastern Europe, we find that regions with a high *regional level of development* and regions bordering other countries attract more foreign direct investment *(border regions)*. Furthermore, regions with international airports tend to attract more FDI.

Moreover, the modelling of regional characteristics shows that *regional industry clustering* (positive) and *regional monopoly structure* (negative) matters when regions want to attract foreign direct investments. Beyond that, clustering of foreign firms *(*high *share of foreign direct investment)* attracts other foreign companies.

Capital city regions attract more foreign direct investment than regions without a capital city. In our modelling we include information on capital cities to find the effect of urbanization. An even better proxy would probably be cities with a population exceeding a given threshold. But because of general robustness of the positive sign of capital city regions, including a more detailed proxy would probably only increase the size of the effect.

Moreover, we do find differences between the overall results for EU27 and results for Eastern Europe. The effect of the *regional unemployment rate* is negative in the EU27 but have no effect in Eastern Europe. An explanation might be: a high unemployment rate can increase the size of the job applicant pool or as in some wage models; a high unemployment rate raises effort because it increases the cost of being fired due to unemployment duration, c.f. Head (1999).

Additionally, the level of *tertiary education* has a positive effect for EU27, but does not have any significant effect on the probability of attracting foreign direct investments to the Eastern European regions. This is related to a higher correlation between education and capital city in Eastern Europe than in the rest of the European Union. In Eastern Europe, the educational gap between rural and urban areas is larger then in the rest of EU27. In Eastern Europe, people with a tertiary education tend to be concentrated in capital city regions. But the level of *secondary education* has a positive effect in the Eastern European regions. This indicates once again that foreign investments in Eastern Europe are generally different from the investments in other European regions. As shown in figure 9, almost 60 per cent of the foreign direct investments in Eastern European regions are done in the manufacturing sector. This sector is normally not related to highly skilled workers.

For EU27, we find that both information and communication technology (ICT) and innovation has a positive effect on attracting FDI. For the Eastern European regions this is only the case for innovation, whereas the level of ICT does not affect the level of FDI. This indicates once again the different investment structure in the Eastern European regions compared to the rest of EU.

Since infrastructure is a relevant determinant of firm locations, we need a variable to proxy the regional level of infrastructure. There are a number of relevant measures, and we have chosen to use the number of passengers in commercial airports. Other proxies could be accessibility by lorry, rail, or car.

Our choice is made to encompass location choices in as many sectors as possible. Where accessibility by lorry is an intuitive proxy in the manufacturing of goods sector, it loses the argument when we look at services. What is relevant in all sectors is that new subsidiaries in foreign regions necessitate accessibility for high ranking business officers on a regular basis. Thus, the airport traffic proxy seems the most natural. The chosen proxy accounts for both the number of connections to other international airports and the frequencies of these flights.

Furthermore, most of the infrastructure proxies are highly correlated such that regions scoring high on one proxy also scores high on the other. Therefore, for practical purposes, the exact choice of infrastructure proxy is not of major importance. In fact, this also means that one proxy should capture other dimensions of infrastructure than what it is actually measuring.

For the Eastern European regions we find that infrastructure has a negative effect on attracting FDI. The negative effect can once again be explained by the FDI structure in this group of regions. One of the main drivers in attracting investments to these regions is the low level of labour cost. Since the commercial airports are place near the big cities and these cities are generally characterised by higher wages, we will get a situation where a better infrastructure seems to make the region less attractive to invest in. The real explanation is probably that it is the higher wages in the cities that hamper the level of FDI.

Some of the variables build on almost unchangeable historical facts like the placement of capital city and borders, or they build on underlying and difficult to influence economic performance like unemployment rates and level of development. But still it looks like there is a role for local politicians to play. Especially the opening of markets and strategies conforming

the industrial specialisation and agglomeration would be model based suggestions for policy recommendations for attracting FDI.

Furthermore, for all EU27, level of tertiary education has a positive effect on attracting foreign direct investments. This indicates the importance of a high educational level if the Eastern European regions want to attract more foreign direct investments in e.g. services. Because of the competition on low cost labour from countries outside Europe, this would have to be viewed as a long-term strategy.

Another policy related variable of interest could be subsidies. But since it is not possible to get consistent information about regional subsidies to foreign direct investment for the entire sample, it is not possible to include it in our model. Other studies are done in sub samples at country level, but do not reach clear conclusions regarding the effect of different kind of subsides; see e.g. Head (1999) and Crozet (2000).

Finally, we focus on the three largest sectors in Eastern Europe; manufacturing, wholesale & retail, and business & finance. Table 3.5 presents the results of the location choice model applied solely to foreign firms from each of the three sectors. Wholesale and retail differ very little from the general results in Table 3.4. Only the industry concentration does not have any effect on attracting foreign firms to this sector.

It is worth noticing that manufacturing has no advantage from a capital region location in contrast to the two other sectors, and furthermore, the *level of education* has no effect in manufacturing. In the finance and business sector, the *capital city* effect overrules the impact of regional level of development and education, but as explained above the educated people tend to locate in large cities and the regional level of development reflect in some way the educational level as well.

Infrastructure and *ICT* have no effect in any of the three sectors, but *innovation* has a positive effect on Wholesale & Retail and Finance.

Table 3.5: Attracting FDI in Eastern Europe regions – differences among sectors

Explanatory variables	Manufacturing	Whole sale & Retail	Finance
Regional level of development	ins+	ins+	ins+
Regional unemployment rate	ins-	ins+	+
Capital city region	ins+	+	+
Regional industry clustering	ins+	ins+	ins-
Share of foreign direct investment	+	+	+
Regional monopoly structure	-	-	-
Border regions	+	+	+
Tertiary education	ins+	ins+	Ins-
Secondary education	ins+	+	ins+
ICT	ins-	ins-	ins-
Infrastructure	ins+	ins-	ins-
Innovation	ins-	+	+

Source: Copenhagen Economics

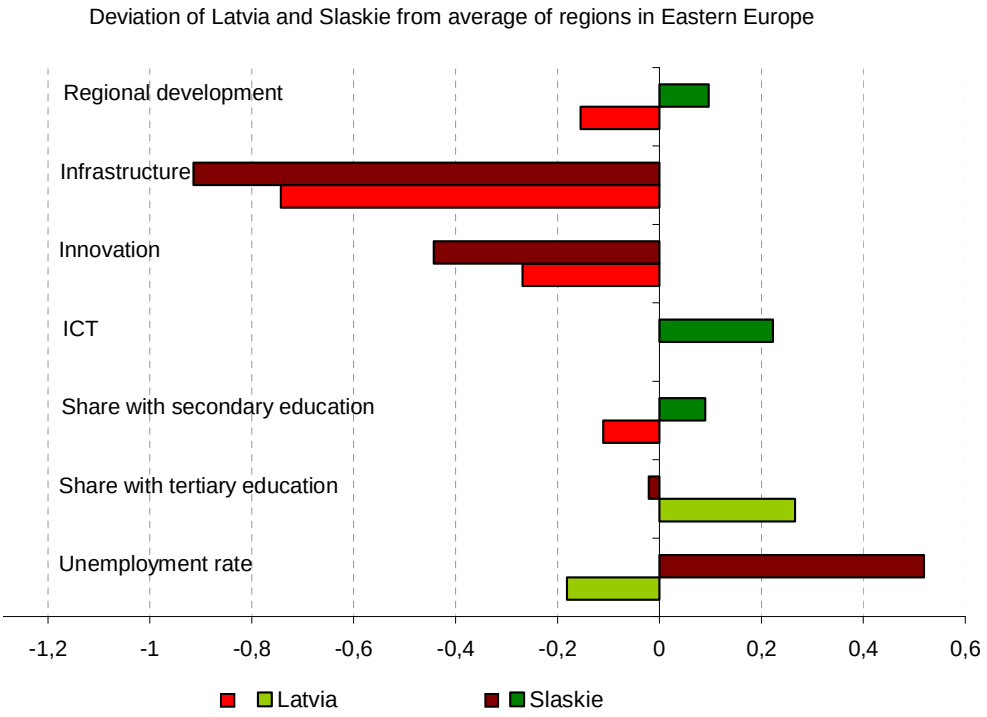
Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.

We have also investigated differences in foreign direct investment in low tech, medium/high tech and high tech manufacturing[13], but the estimation results are too uncertain and have been omitted from this report.

To supplement the econometric analysis, we take a closer look at two regions having experienced above-average FDI; Slaskie in Poland and Latvia (which constitutes its own NUTS 2 region). It is apparent from Figure 11 that even though Latvia and Slaskie have been able to attract above-average FDI, the regions also have important weaknesses. Thus, Box 3 and Box 4 provide insights on which other factors that have created the inflow of investments to the two regions.

[13] The definition of low tech, medium/high tech and high tech manufacturing is similar to the definition in O'Mahony (2003).

Figure 11: Regional attraction factors of Latvia and Slaskie relative to the regional average in Eastern Europe



Source: Copenhagen Economics

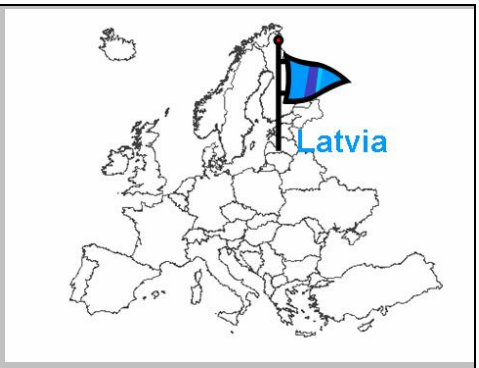
Note: The regional attraction factors are reported as the difference to the average of regions in Eastern Europe divided with the regional average in Eastern Europe. Green colours represent a better situation than the EU27 average whereas a less attractive situation is reported in red colours. ICT data for Latvia is not available.

The case studies build on interviews with the local authorities – in both cases the inward investment agency – and on desk research[14]. The question guide can be found in appendix D.

[14] None of the less successful regions have been examined through desk research and interviews. This is due to two methodological problems. The first problem concerns the validity of the information that can be collected. If an interviewer starts asking questions about the performance of a region that is underperforming, then it is problematic to conceal the underperformance from the respondent. Given that the respondent is in some way involved with the activities of the region, which is what makes her qualify for being a respondent, there is a real risk that the answers will not be valid. The respondent is disqualified. The second problem is simply that it has shown to be hard to find good information about regions that are underperforming. Many of these regions do not have a web page with basic information about the region, and it has not even been possible to find out which person to talk to about the region and the performance of the region. In sum, the second problem concerns the lack of a professional investment promotion agency.

Box 3 FDI in Latvia

From the beginning of the 1990s, investors from the neighbouring countries in the Baltic Sea Area have been very active in Latvia. Even though other countries have increased their involvement in the country, over 50 percent of the FDI stock still originates from the Baltic Sea Area. The investments are almost entirely greenfield and cover a variety of fields from ICT, finance and trade to fully export-oriented manufacturing. The Latvian Investment and Development Agency (LIDA) lists two main reasons for the large stock of FDI that originates from the western Baltic Sea Area.



First, there is a substantial difference between the operating costs in the eastern and the western part of the Baltic Area. Latvia does use state support programmes, grant schemes, and has created special economic zones where grants are given to enterprises in development areas. However, the director of LIDA, Mr Andris Ozols evaluates this to be less important relative to the underlying regional characteristics.[1]

The second reason for attracting FDI is that the Baltic market is growing very fast and that a position in Latvia also creates a strategic window to Russia and the CIS. The latter also constitutes a major reason for 'the second wave of investors' from The Netherlands, UK and the USA. For eastern countries like Russia, Latvia is mostly chosen as an investment area in order to use logistic facilities for oil products, chemicals and metals for other export markets.

When looking at the decisive regional characteristics, it gives an overall impression of an attractive business climate. The World Bank snapshot report of Latvia from 2005 confirms this.[2] With regards to the cost side, Latvia has low corporate and income tax rates and low prices on energy. The infrastructure is well-developed, ranging over air, land and sea. The workforce is highly motivated and generally of a good quality. In addition, there are people with language skills in both Russian and English and there is a fast growing pool of specialists in IT and applied technologies. Mr Andris Ozols reports that this is one of the main reasons why ICT now accounts for 22 percent of the accumulated FDI in Latvia.

[1] Telephone interview with Andris Ozols, Director the Latvian Investment and Development Agency.
[2] World Bank Enterprise Surveys - Latvia: http://www.enterprisesurveys.org/ExploreEconomies/Default.aspx?economyid=108

Source: Copenhagen Economics

Box 4: FDI in Województwo Śląskie, Province of Poland

From the skilled craftsmen of the 1970s to engineers and university specialists today, qualified labour force remains a key factor influencing foreign investors' choice of the Śląskie region. On its road to becoming Poland's most successful recipient of FDI in manufacturing, the region has built on its legacy of Poland's industrial centre, nourishing the automotive and industrial manufacturing sectors and attracting strategic investors to restructure the ailing steel making. Finally, should the above fall short for attracting potential investors, the incentives offered by the Katowice special economic zone (SEZ) may tip the balance.

Originally pillared on coal and steel monoculture, the region's economy has been focusing on attracting investments within high value-added, high-tech manufacturing since the groundbreaking investment of Fiat in the early 1970s. The onset of economic transformation in the early 1990s gave further momentum to this process. The arrival of the €300 million GM Opel plant in 1998 marked another milestone, and further players soon followed suit. Today, the automotive cluster comprises a network of some 44 sub-suppliers. Their sine qua non is top quality manufacturing obtained not the least through internalizing the spillovers from the world-class car manufacturers in the region.

The quality of Śląskie's infrastructure is only second to that available in the Warsaw capital region, while set-up and operating costs can be markedly lower for companies. Investors have been attracted by the rich socio-economic networks, high density of product-thirsty consumers and the abundance of labour skilled for both the new and traditional sectors. Moreover, regional soft factors, such as 'strong industrial culture and heritage' and 'urban flair' add to the region's attractiveness as an FDI-destination. Finally, on a sector level there is some case evidence that existing FDI influences location choice of further investors, which especially contributes to the growth of automotive and machinery clusters.

Attraction and retention of FDI has also been successful due to incentive instruments available under the SEZ scheme. In the mid-1990s, adoption of investment-promoting policies on the national level spurred the establishment of the Katowice special economic zone (SEZ). The zone comprises a designated group of readily available investment locations in the region, to facilitate job creation and accelerate regional restructuring. Offering attractive investment spots, individualized treatment and efficient administrative procedures and tax reliefs to investments above a certain threshold, the SEZ now hosts about 30% of the FDI stock in Śląskie. The success of the SEZ scheme sparked off lobbying for its expansion, especially to attract further foreign investors. In practice, this means that SEZ status is to some degree negotiable and can be granted to attract a specific large foreign investment.[1]

In promoting the growth of high-tech industries, Śląskie's education and research institutions strive to internalize and build upon technological spillovers from FDI. Cases in point are the modernization of the Mittal Steel's steel mill in Katowice; the joint research project on advanced coal gasification technologies between the Silesian Technical Energy and companies within the energy sector; as well as aviation engines manufacturing in the light aviation sector.[2]

Tadeusz Adamski, director of the Economic Policy Department of the Śląskie regional authority gives the following testimonial:[3]
"When meeting a potential investor, I can call upon the presidents of the major universities in the area to ensure a continuous access to a pool of newly graduated engineers, sales or IT-professionals of the specialty investors require for going ahead with a particular project. Our region's 42 higher education institutions, with over 200,000 students and 27,000 research staff make us more than capable for keeping the promise. Investors are frequently impressed with the quality of the people they find here."

Continuing the efforts to activate the structurally unemployed and to remove red-tape impediments to foreign investment are likely to positively affect the image of the region and keep up the momentum of investment and growth.

[1] Bazydło A., & Smętkowski M.: Special Economic Zones – An Opportunity for Urban Regions in Poland, unpublished manuscript, Warsaw University, 2000; and Katowice special economic zone homepage: http://www.ksse.com.pl/przewodnik.html
[2] Śląskie region homepage: http://www.silesia-region.pl/
[3] Telephone interview with Tadeusz Adamski, Director Economic Policy Department of the Śląskie region (Wydział Polityki Gospodarczej Województwo Śląskie).

Source: Copenhagen Economics

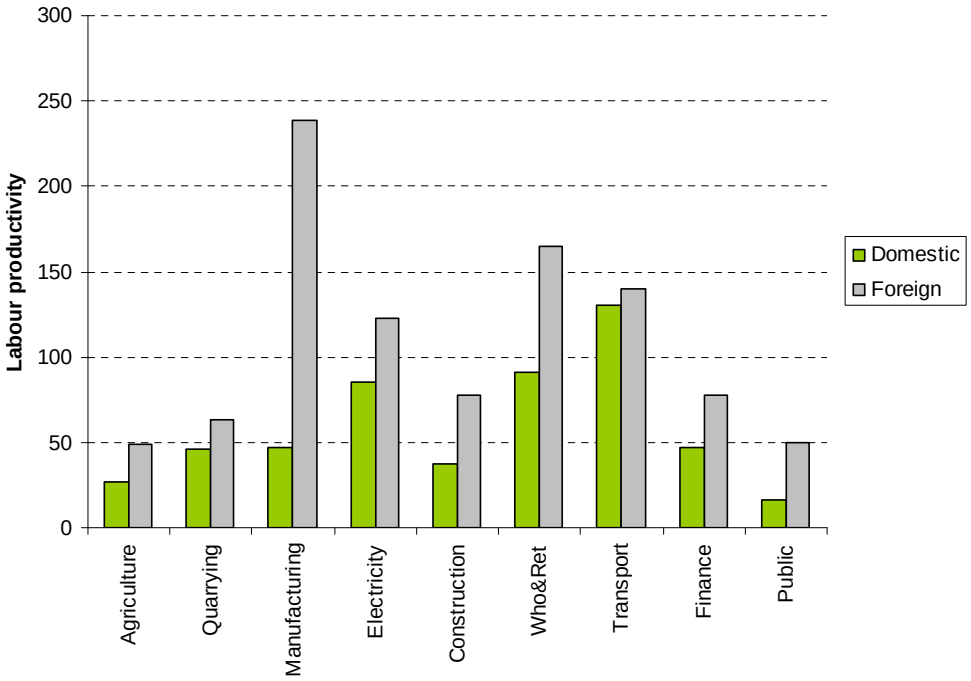
In summary, our study shows that most of Eastern Europe is considered as one market. There are two kinds of investments: local market (mostly in services sectors) and low labour cost (mostly in the manufacturing sector). These are attracted by different type of factors. Today most of the foreign direct investment is in the manufacturing sector; cf. Figure 9, because of low cost labour advantages. But high growth rates mean higher wages whereby the position as low cost labour supplier will change over time. Therefore Eastern European regions should not only focus on the characteristics of their own group of regions but also on the general effects, since low level of salary is not necessarily future-proof. In other words, Eastern European regions may also invest in ICT, innovation and a higher level of education to ensure future competitiveness.

3.2. Productivity spillovers in Eastern Europe

Foreign direct investments are in general thought to have a positive impact on the domestic economy because of the specific knowledge they bring. Normally, foreign firms are entering a local market if they have certain competitive advantages which make them more productive than their local counterparts. Therefore the main focus for a foreign investor is not to gain new knowledge, but to exploit their core competences on various local markets. Due to this, it should be expected that the new technology and business conducts potentially could be copied by local competitors, although this is clearly not in the interest of the foreign entrant.

On the basis of our large firm level database, we have investigated the labour productivity level for domestic and foreign firms separately and across all sectors we find higher productivity in foreign firms than in their local counterparts, c.f. Figure 12. Especially in the manufacturing sector the gap is of large magnitude. This tells us that there is a good basis for generating productivity spillovers in Eastern Europe.

Figure 12: Labour productivity of foreign and domestic firms



Source: Copenhagen Economics
Note: the figure shows the labour productivity, i.e. operating revenue per employee.

Modelling the effects of spillovers verify the result that foreign firms are more productive and local firms can learn from them. To start with, we focus on the spillover effects appearing between companies in the same industry as the foreign investment, but later in this report we also investigate the backward linkages spillover effects that might appear to the supplying industries. We set up a framework to identify the spillover effect across sectors and regions and find very significant effects.

For Eastern Europe, we find that foreign direct investments have had a positive effect on the level of labour productivity for all sectors. Said in another way, domestic firms increase their productivity when foreign firms enter the same industry, cf. table 3.6. All effects are highly statistically significant.

Table 3.6: Average within-industry productivity spillovers for a given sector, Eastern Europe

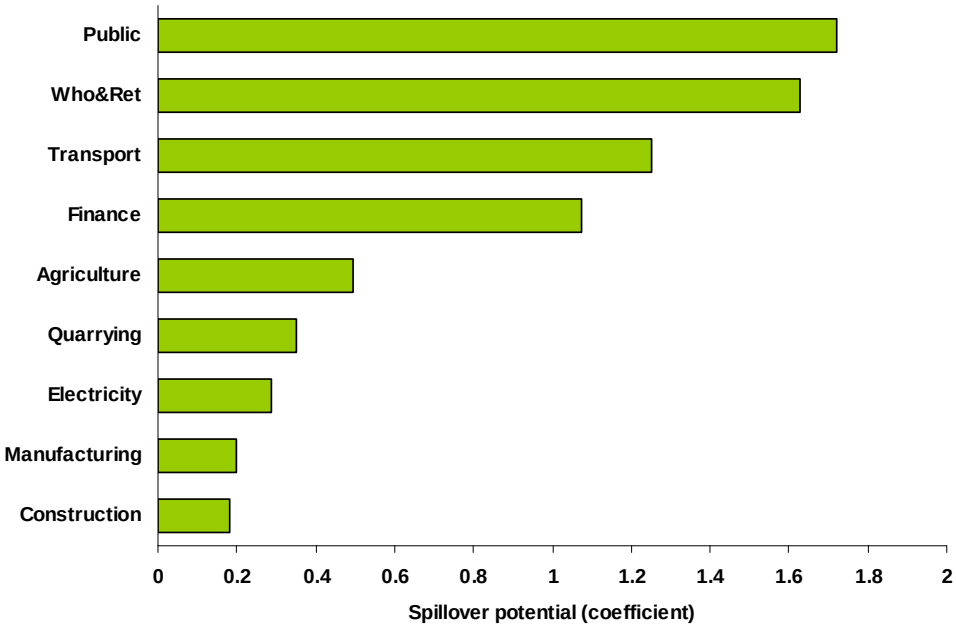
	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Within-industry productivity spillovers	+	+	+	+	+	+	+	+	+

Source: Copenhagen Economics
Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The estimated coefficient represents the average within-industry effect of increased FDI on labour productivity. Spillovers between industries in the same sector, e.g. manufacturing, have not been included.

To investigate the size of the spillover effect we take a closer look on the estimated effect and compare the coefficient estimate across sectors. The estimate can be interpreted as the percentage change in labour productivity from the case with no foreign investments to the case when the last domestic firm is surrounded by foreign firms. Alternatively, we may interpret the

estimate as maximum spillover potential.[15] Generally, the estimated spillover effect for Eastern Europe is similar relatively across sectors to the overall EU effects, although the magnitudes of effects are generally somewhat higher in Eastern Europe. Eastern Europe gains a lot in wholesale & retail and business services (finance), c.f. figure 13. Moreover, in the services sectors the spillover effect is much larger than in the goods producing sectors.

Figure 13: Size of average within-industry spillover coefficient across sectors, Eastern Europe



Source: Copenhagen Economics
Note: The figure displays the spillover coefficients for each sector.

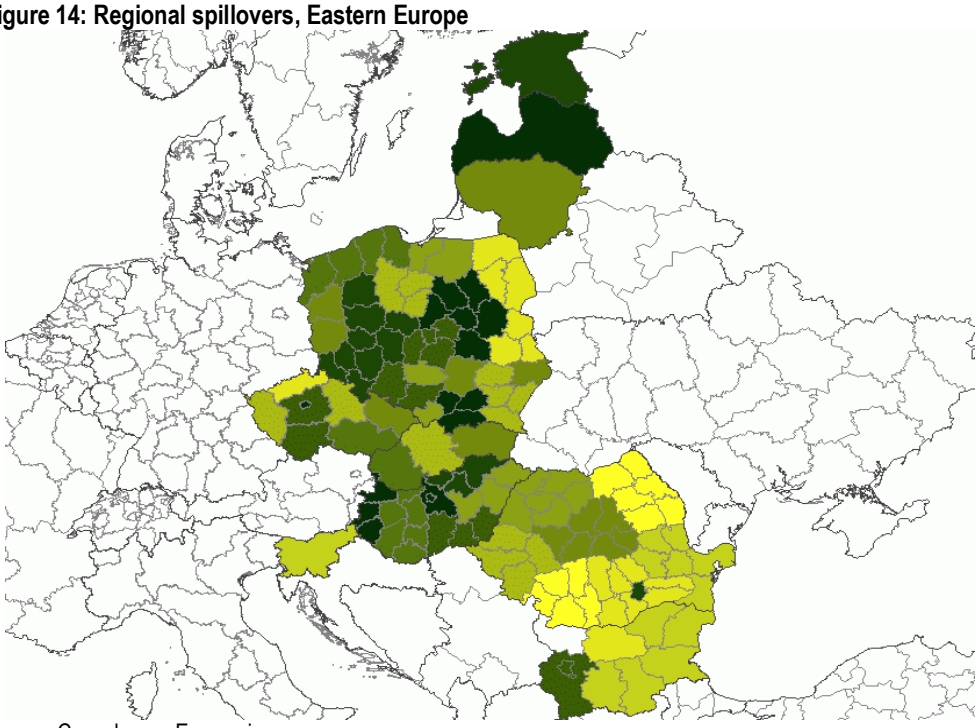
We should also highlight that according to our empirical models this group of regions has also experienced significant spillovers through backward linkages. This implies that spillovers are not only an intra-industry phenomenon, but they exist in parallel across industries. Thus, looking solely at the same industry, we would tend to underestimate the total productivity spillovers.[16]

This far, we have only identified how foreign firms affect domestic firms on a micro level, but are there differences among regions within Eastern Europe if we measure the aggregate spillovers? Formally, this aggregate effect has been calculated by adding the results from each sectoral model together.[17]

As a result of this exercise, we find Estonia, Latvia and regions in the Czech Republic, Poland, and Hungary to gain most according to the effect of productivity spillovers, c.f. Figure 14. The high impacts are mainly a result of high levels of FDI, but also the sectoral composition of FDI has contributed to the regions with the highest impacts. On the other end of the scale, we find Romania, Bulgaria and Slovenia, which have the smallest spillover effect mainly due to the small FDI inflows in these regions. On a broader European scale, the lower spillovers in the Eastern regions of Eastern Europe are still relatively high.

[15] Note the word potential – the estimate says nothing about how far this potential has been exploited so far.
[16] Further results can be found in Appendix C.
[17] Technically, we have used the econometric models to predict the spillovers, and then weighted the results together according to sectoral weights.

Figure 14: Regional spillovers, Eastern Europe



Source: Copenhagen Economics

Note: The figure shows the predicted size of all spillovers in each region. Darker green represents higher spillover impacts. The impacts have been calculated by weighting the products of spillover coefficient and sectoral FDI together to an aggregate regional spillover impact.

3.3. Impacts from FDI on labour markets in Eastern Europe

Foreign direct investment has a range of impacts on the host region economy. Most notable is the labour market, which is a new area of research. The labour market effect includes both a direct and an indirect effect. Our methodology assures that we analyse both the direct and indirect effects of FDI inflows on labour demand.

Our methodology consists of three steps: First, we investigate the direct effect of foreign investments on labour market, i.e. what happens when a firm is taken over by a foreign investor? The second step is to investigate the effect on the number of employees in domestic firms within an industry after takeovers and greenfield investments have taken place. Finally, we look at the overall effect including inter-industrial linkages.

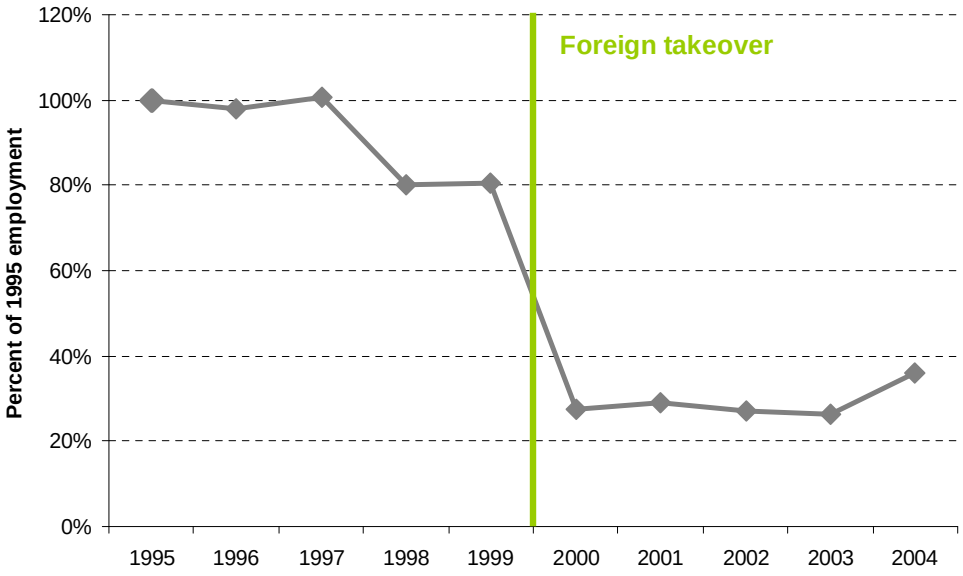
Mergers & Acquisitions model

Our Merger & Acquisitions model[18] only focuses on the takeover effect on short-run employment. We find that labour demand is reduced by approximately 2 percent in the short run after a foreign takeover if we consider all European takeovers. This effect is even more significant if we focus on mergers and acquisitions in Eastern Europe where the corresponding estimate is almost *minus* 7 percent.

We give a concrete example of a Latvian company being acquired by foreign investors in the beginning of 2000, cf. figure 15. At the time off takeover the foreign investor reduced the number of employees dramatically (and by much more than the average effect of minus 7 percent). After a couple of years, though, efficiency improvements appear to breed gradual increases in labour demand.

[18] Details of the model and detailed results can be found in Appendix C.

Figure 15: Development in firm employment before and after takeover



Source: Copenhagen Economics

Note: The figure shows the development in employment in a typical firm being acquired by foreign investors. The graph is based on actual data, but the firm's identity has been covered by indexing the development to the 1995 employment figure.

Labour effects within industry

Second, we investigate whether the local competitors are affected by the presence of foreign subsidiaries. Our econometric model generally suggests that the local companies in Eastern Europe are negatively affected and reduce their labour demand if FDI appears. This applies to all sectors except quarrying and manufacturing where this effect is far less pronounced. The general effect for Eastern Europe is negative, but we should also remember that increased productivity among local firms eventually creates more possibilities for local employees.

Table 3.7: Effects on competitors (within industry) labour demand

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Effect from FDI on competitors labour demand	-	ins-	ins-	-	-	-	-	-	-

Source: Copenhagen Economics

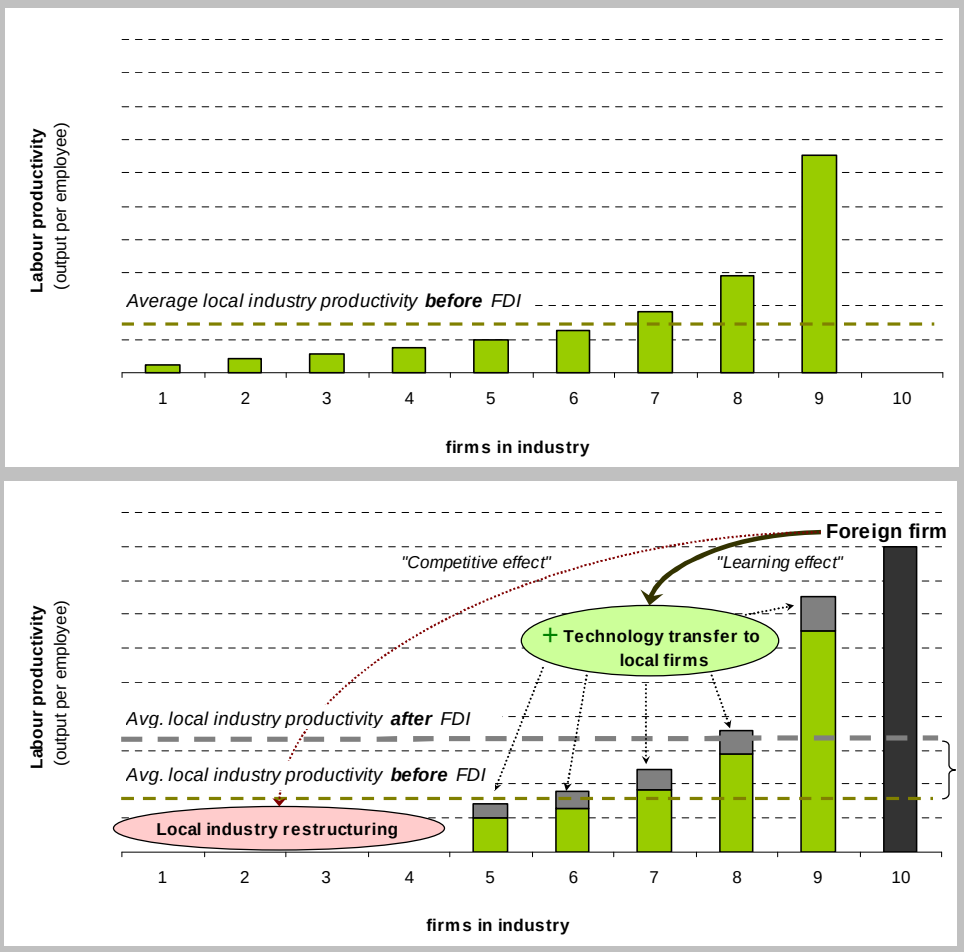
Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant.

Going back to the previous sections on productivity spillovers, we have found that foreign direct investment increases productivity for domestic firms. At the same time, we have just established that domestic firms become more reluctant to hire employees in FDI-intensive industries. Thus, it will be a reasonable interpretation of the results to infer that improved competition from a foreign investor might force the most inefficient firms out of the market. As these inefficient firms normally are the most labour intensive as well, it can explain the negative effect on labour demand in domestic firms, c.f. Box 5. We should here mention the results of de Backer and Sleuwaegen (2003), also concluding that FDI has a disciplining effect on market participants, but that domestic entrepreneurship may suffer under these conditions. On the other hand, the quality of entrepreneurship is much higher under the presence of FDI.

Box 5: Productivity spillovers

The figure below shows a typical example of local firms in an industry in the region ranked after their initial productivity. The dotted line shows the average productivity for the local industry. In the lower diagram we presume a foreign firm (a greenfield investment) with a high level of productivity enters the market. Local firms will learn from the foreign firm through transfer of new technologies, management skills and new business models from foreign to local firms. Local firms thereby increase their productivity ("Learning effect"). Another effect is also present resulting from foreign firm capturing market shares from the least efficient local firms. These firms have to close down and the local industry restructuring that inevitably follows add to the average productivity of the remaining local firms ("Competitive effect"). Figure 16 sum up on the above-mentioned effects.

Figure 16: Productivity spillovers



Source: Copenhagen Economics

Note: The graphs represent labour productivity for different firms within the same regional industry. The upper graph depicts the situation without FDI and the lower graph the situation after FDI. The average productivity increases due to both **learning effects** (local industry productivity gains through technology transfer) and **competitive effects** (local industry restructuring through crowding-out of the most inefficient).

From an economic point of view, it is less clear whether the measured reduction in labour demand is favourable or not. On the one hand, better and more secure jobs seem to be created; on the other hand, temporary unemployment is a necessary step on this road.

Regional labour demand effects

So far we have only looked at the effects within the industries. But an effect in labour demand in one industry can affect the rest of the economy. For example, if a sector becomes more productive due to FDI, this sector will be able to deliver more goods and services – possibly at lower prices – to firms throughout the economy, and this will induce increased production and labour demand in all of the economy.

Therefore we set up an econometric model including the overall regional labour effect by including all sectors and domestic as well as foreign firms. All in all we find that the total labour market effect is positive and overrule the negative effects from takeover restructuring and loss of market shares for competitors, cf. Table 3.8.

We find very convincing results that labour demand is positively influenced by high FDI intensities. Indeed, this is a stronger finding than what occurs at first glance. We have just established that much of the productivity spillovers can be attributed to industry restructuring, i.e. closure of the most inefficient (and typically labour intensive) firms, and this effect should exist equally in other industries, and despite this the economic stimulus from increased productivity dominate the overall picture.

Table 3.8: Effects on the regional labour demand

	Europe	Group 1	Group 2	Group 3	Group 4	Group 5
Effect from FDI on the regional labour demand	+	+	-	+	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of the spillover estimate. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. We present the results for IV regressions with country dummies.

Box 6: The effects on regional labour demand

FDI has several direct and indirect effects on labour demand. In this study, we look at three levels: (1) the intra-firm effect of takeovers (Merger & Acquisition); (2) the within-industry effect from FDI; and (3) the net regional effect.

In this box, we emphasise that the net regional effect is *not* the same as the sum of the two former effects. First, we have not considered greenfield investments. These will always have a non-negative direct effect on regional labour demand. A new firm can never hire a negative number of employees. Second, we have not taken the productivity spillovers into consideration. Increased productivity will increase competitiveness and the positive effects will be transmitted throughout the economy and create new jobs in other industries and other sectors.

In the table below, we provide an overview of the various effects and their estimated signs (we have actually only estimated (1), (2), and (3), but the remaining effects can be deduced from (3)). The table shows the two negative effects measured in the earlier stages of our labour demand analysis plus the positive contributions from greenfield investments and cross-industry knock-on effects. The net effect is positive in the constructed example. In the real sample the net effect is also positive except for the cohesion regions.

Table: The net effects of FDI on regional labour demand

	Effect on labour demand
(1) Merger & Acquisitions	-
Greenfield investments	+
(2) Within- industry effect from FDI on local competitors labour demand	-
Cross-industry effect from productivity knock-on effects	+
(3) Net regional effect	+

Source: Copenhagen Economics

Chapter 4 FDI in cohesion regions (before 2004)

This chapter is concerned with FDI in the so called cohesion regions, East Germany, Greece, Ireland, Spain, and Portugal, and how these flows impact the regional economies. In particular, we consider the factors attracting FDI, the influence on regional productivity, and the impact on regional labour markets.

Our empirical modelling shows that the cohesion regions have significantly benefited from FDI. Ireland, North Spain and East Germany have most successfully attracted foreign direct investments. The impact of FDI in all regions has increased productivity for local firms both within and between industries. In terms of increased labour demand, the cohesion regions are still waiting to materialise the positive effects of increased productivity.

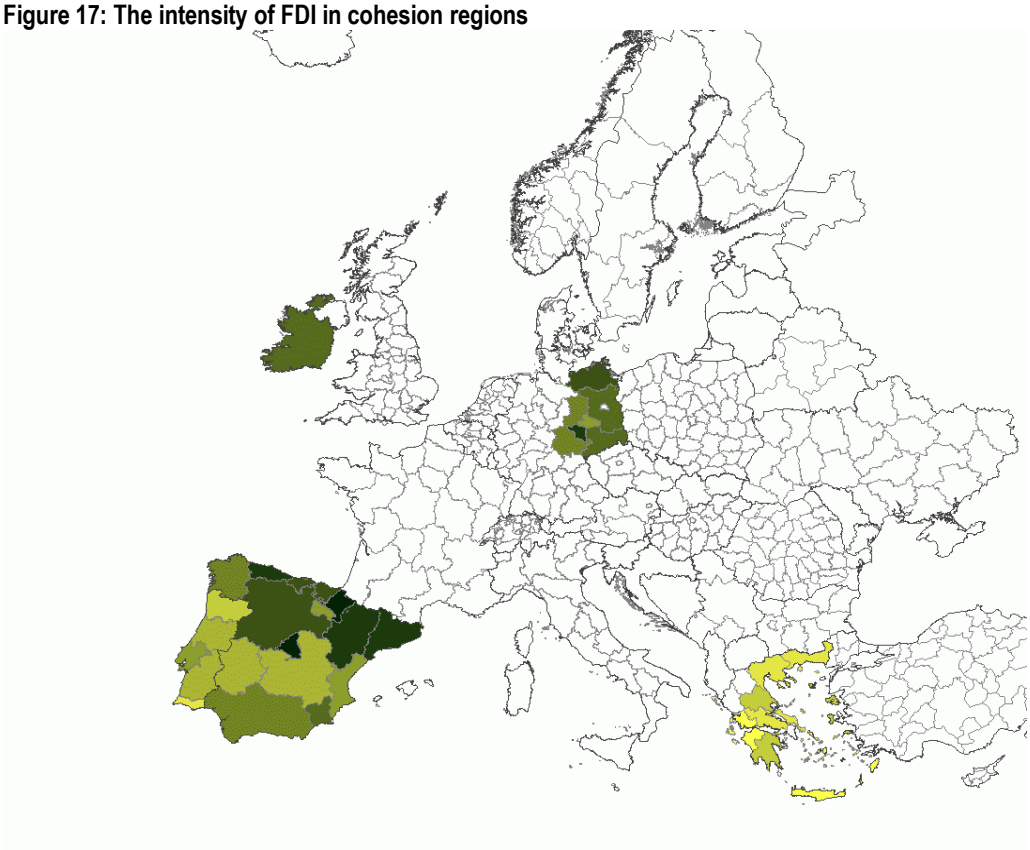
We have used the information contained in a large-scale company database to conduct the empirical analysis and from these data we provide both geographical and sectoral analyses of FDI. We have measured and mapped the intensity of FDI in each region, see Figure 17.[19]

From the map, we observe both international and intra-national differences. FDI intensities are generally low in Greece and Portugal, but high in Ireland, Spain and East Germany implying that we have a somewhat heterogeneous collection of regions. For the use in statistical models, this can both be an advantage as the heterogeneity generates statistical variation, and a disadvantage if the economic effects are opposing. Intra-nationally, we find the largest diversities within Spain where the Northern regions seem to be much more attractive to foreign investors than the Southern regions. Altogether, FDI appears to be dependent on the economic development of each region.

From the overall perspective of improving economic conditions, FDI may not be the only relevant measure in East Germany since many West German investors have taken advantage of the possibilities in these regions and brought with them new knowledge and capital. Thus some would find it desirable to include the West German investments in the FDI measure, but such considerations would lead to many cases where similar arguments could be applied. Hence, we look strictly on *foreign* direct investments.

[19] Mainly due to data availability, we prefer to measure the FDI-intensity as the total number of employees in foreign firms divided by the total number of employees in the region. All FDI data refers to the year 2004.

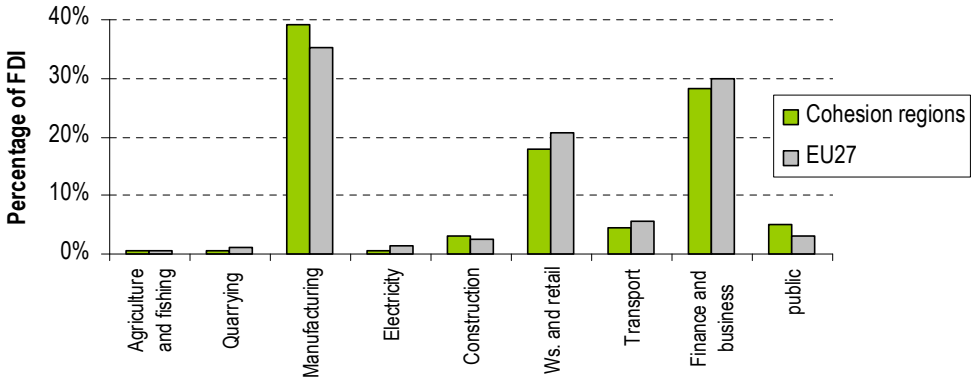
Figure 17: The intensity of FDI in cohesion regions



Source: Copenhagen Economics
Note: The map shows the intensity of FDI measured as the number of employees in foreign firms to total employees in the region. The darker green colour corresponds to higher FDI intensities.

Not only the geographical aspects of FDI, but also the sectoral aspects are of interest for the purpose of our empirical analyses. Therefore, we have calculated the distribution of FDI across sectors, c.f. Figure 18. We have done this by calculating both an average EU27 distribution and the distribution for the cohesion countries.

Figure 18: Distribution of FDI by sector



Source: Copenhagen Economics and the Amadeus database

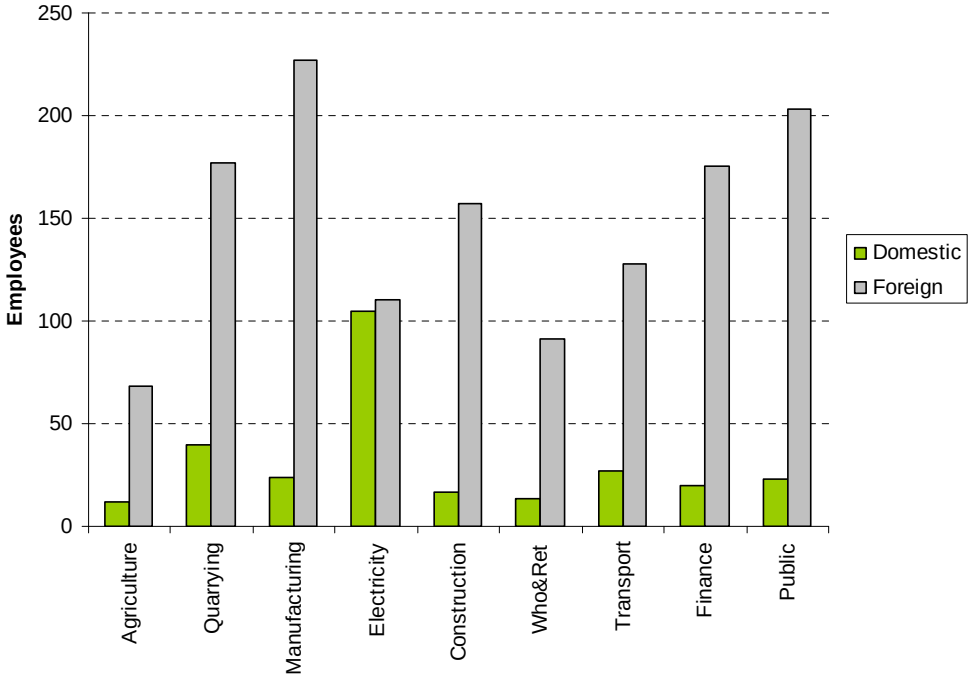
Compared to the EU average, FDI inflows are quite similar in the cohesion regions. The only minor difference is the slightly higher share in manufacturing equilibrated by the slightly lower shares in services.

Considering the geographical and sectoral aspects together, we actually see a picture very similar to the more general EU pattern. Proximity to the largest European markets is of great importance to manufactures, and the regions with the highest economic development are also more likely to have high FDI intensities. Simultaneously, the sectoral composition moves towards services sectors as regions become economically more developed.

Before turning to the formal empirical analyses, it is also relevant to get an impression of the typical foreign subsidiary. In our sample, which generally covers all the largest European firms, foreign subsidiaries are much larger than local competitors in the cohesion countries, see Figure 19. We find similar sizes of domestic and foreign firms in the other regions except for Eastern Europe where the size difference is much smaller.

Obviously, this type of difference in firm size can be a barrier to knowledge spillovers since the implementation of certain technologies or managerial practices are only adequate when working in larger units so that only a few local firms may learn from the foreign subsidiaries.

Figure 19: The size of foreign and domestic firms across sectors



Source: Copenhagen Economics

The rest of this chapter presents the results of our econometric modelling. In the first section, we look at the factors attracting FDI; in the second section, we consider how FDI affects domestic productivity; and in the third section; we investigate the impacts on regional labour markets.

4.1. Attracting FDI to cohesion regions

In this section, we estimate the factors that make cohesion regions more attractive to foreign investors. All results are based on a large range of estimations and have shown to be robust across specifications.

Cohesion regions "behave" more or less like the average European region concerning the factors to attract FDI. For example, they are much more dependent on the ability to sell to the

domestic market than Eastern Europe which is more characterised by FDI seeking cheap labour.

We have established that one important aspect of location choice is the geographical hierarchy; first, investors look for the right country, secondly, they select among the regions within the chosen country. Thus, it should be emphasized that regional characteristics do not rank in top of the list. To this respect, we have adapted the empirical modelling to assist the decision structure by splitting the analysis in two steps. In the first step, we estimate what national characteristics are preferred by foreign investors, and in the second step, we assess the importance of regional characteristics.

To see the effect of nationality, Table 4.1 shows the four most common investing countries by recipient country. The table illustrates the effect of proximity on a national level. Countries tend to invest more in a country near to home than other countries, e.g. Spain in Portugal, France in Spain, Great Britain in Ireland, etc.

Table 4.1: Who invest in cohesion regions?

	The four most common home countries of investors			
Host country	***Rank 1***	***Rank 2***	***Rank 3***	***Rank 4***
Spain	*France*	*Germany*	*The Netherlands*	*Great Britain*
Greece	*France*	*The Netherlands*	*Great Britain*	*Germany*
Ireland	*Great Britain*	*USA*	*The Netherlands*	*France*
Portugal	*Spain*	*France*	*The Netherlands*	*USA*
East Germany	*Austria*	*USA*	*France*	*Belgium*

Source: Copenhagen Economics
Note: The largest investor (number of firms) is placed next to the host country, then the second largest and so on.

Attracting FDI at the national level
We have conducted a large number of estimations and obtained very robust results. We have estimated general models where all countries from EU27 are included, and we have tried to refine these models to capture specific effects for the cohesion regions. It turned out that the size of effects did not differ from the EU-average, and therefore we simply present the general results below. Readers having already been through section 3.1, may therefore want to skip the following paragraphs.

As just laid out, we focus on the most general estimations where all of EU27[20] and all sectors have been included c.f. Table 4.2. The table shows how different factors have a positive or negative influence on inward FDI flows.

[20] EU27 is EU25 plus Romania and Bulgaria.

Table 4.2: The effect of national characteristics on attracting FDI

Explanatory variables	*Definition*	EU27
National market size	National GDP in latest available year (source: Eurostat)	+
Level of development	National GDP pr capita in latest available year (source: Eurostat)	+
Corporate tax	The national standard rate of taxation on corporate income (source: European Commission)	-
Proficiency in English	Percentage of population that speak English (source: Eurobarometer)	+
Unemployment rate	National unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-
Countries with related languages	Dummy variable: takes the value 1 if language of host and home country are the same for some part of the countries; zero otherwise. See appendix B for further information	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant

We find that the *market size* of a host country is the single most important factor in attracting FDI. Including *market size*, the model explains 17 per cent of the location choice variation, but without the explanatory power drops 8 per cent. Explaining around 17 per cent is fairly successful compared to other location choice models of similar kind in the literature. The 9 per cent contribution from the market size variable is clear evidence that the size of the national market is essential when multinational firms choose their location in the EU27. Said in another way, a firm chooses a particular country because it wants to get into a given national market[21]. It is likely that the enforcement of the internal market eventually will change this pattern by making national markets less important for all types businesses.

In second place, we find that other basic economic variables contribute considerably to the explanatory power of the model. For instance, the *level of economic development* increases the inflow of FDI.

A high c*orporate tax* rate leads to a reduction in the probability of attracting foreign firms, indicating the fact that lower taxes mean higher profit to the firm, which has a pulling effect. The effect is far from the most important, and this indicates that direct financial incentives are not dominant factors for FDI attractiveness.

Furthermore, countries with a low *unemployment rate* attract more FDI. There could be two reasons for this; first, because a high unemployment rate indicates strong rigidities in the labour market, and second, because high unemployment could indicate low ability of the labour force.

Finally, but not surprisingly, the ability to communicate in an adequate manner tends to raise the inflow of foreign investments. More precisely, a high level of *English* language skills attracts FDI, but it has a larger effect on attracting FDI if host and home are able to communicate in their own language. The "*countries with related languages*" variable may also include the effects from cultural proximity.

[21] We have done the same on regional data but the regional market size doesn't affect the choice of region in the same way as on a national level.

Attracting FDI at the regional level

Next step in the analysis is to investigate how regional characteristics affect the ability to attract FDI. We eliminate the dominating national effect (by the use of econometric techniques) to be able to compare regions within and between countries. All variables are now defined on the regional level. We have conducted estimations for EU27 as the benchmark and separate regressions using only the foreign firms located in the cohesion countries.

For both EU27 and the cohesion countries, we find that regions with a high *level of development* attract more FDI, c.f. Table 4.3. Together with *bordering regions*, these are the two most important factors in attracting FDI at the regional level. Also there seems to be some clustering of foreign firms in certain regions according to the positive coefficient of *Share of foreign direct investment*. In other words: the choice of region is driven by the productivity of the workforce, the infrastructure, and the proximity to the home country.

The regional level of *ICT* and *innovation* does also have a positive effect on the level of foreign direct investment. We have left out the effect of *infrastructure* (passengers in airports) from the model of the cohesion regions, because of very high correlation with the regional level of development and capital city.[22]

Furthermore, we find that *industry concentration* (*Regional monopoly structure)* has a negative effect on attracting foreign direct investment in cohesion regions – higher entry barriers obviously also keep foreigners away.

Next, we find that the regional *level of tertiary education* has a negative effect on the level of investment in the cohesion regions, but the level of secondary education has a positive effect. We cannot be sure whether this ambiguity regarding education in the cohesion region regressions is due to statistical reasons, e.g. that the number of observations is much lower for the cohesion region sub-sample and that the variation has been significantly reduced, or due to economic reasons[23].

For this reason, we believe that the EU27 regressions could have equal validity for the cohesion region sub-sample even though the sub-sample regressions do not yield exactly the same results. In other words: we suggest a very cautious reading of the sub-sample regressions. Especially, we have consistently obtained significant positive effects in industry clustering and education, and we believe this holds for the cohesion regions too.

[22] Whenever different explanatory variables are highly correlated, the econometric model will get difficulties in assigning explanatory power to all of them. Therefore, it is normally preferable to include only a small subset of the correlated explanatory variables, but remember to interpret the effect as a combination of many factors – not just those included in the parsimonious model.

[23] The explanation differs from the one in the group of Eastern European regions. First, the estimations are done on two different sub-samples with different level of variation and second, the absence of a good intuitive economic explanation for the cohesion regions.

Table 4.3: The effect of regional characteristics on attracting FDI

Explanatory variables	Definition	EU27	Cohesion regions
Regional level of development	Regional GDP pr capita in latest available year (source: Eurostat)	+	+
Regional unemployment rate	Regional unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-	+
Capital city region	Dummy variable: takes the value one if a capital city is placed in a region and zero otherwise	+	ins+
Regional industry clustering	Regional location quotient for each specific industry, measured as relative share of a specific industry in the region compared to the national share	+	+
Share of foreign direct investment	Share of foreign direct investment by region and industry	+	+
Regional monopoly structure	Herfindahl index: - high value: few firms and no competition - low value means many small competitors	-	-
Border regions	Dummy variable: takes the value one if the region is a bordering another country in EU27	+	+
Tertiary education	Share of regional labour force with a tertiary educational level (source: Eurostat)	+	-
Secondary education	Share of regional labour force with secondary educational level (source: Eurostat)		+
ICT	Share of firms with their own website	+	+
Infrastructure	Traffic in commercial airports	+	
Innovation	Total intramural R&D expenditure (share of GDP)	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.

Our econometric model allows a subdivision of the sample so as to e.g. focus on particular sectors. Of course, this means a reduction in the number of observations and therefore also in reliability, but generally the conclusions do not change, c.f. Table 4.4. The basic results on economic development and neighbour country effect remain the same. Education, ICT and innovation all seems to have the same effect no matter which sector we analyse. The only differences to the former regional analysis are that industrial clustering becomes much harder to measure and the effect of capital belonging is not clear. Probably, this is a statistical rather than an economic artefact.

Table 4.4: Attracting FDI – differences among sectors

Explanatory variables	Manufacturing	Whole sale & Retail	Finance
Regional level of development	+	+	ins-
Regional unemployment rate	+	+	+
Capital city region	-	ins-	+
Regional industry clustering	ins+	ins+	ins-
Share of foreign direct investment	+	+	+
Regional monopoly structure	-	ins+	-
Border regions	+	+	+
Tertiary Education	-	-	-
Secondary Education	+	+	+
ICT	+	+	+
Innovation	+	+	+

Source: Copenhagen Economics

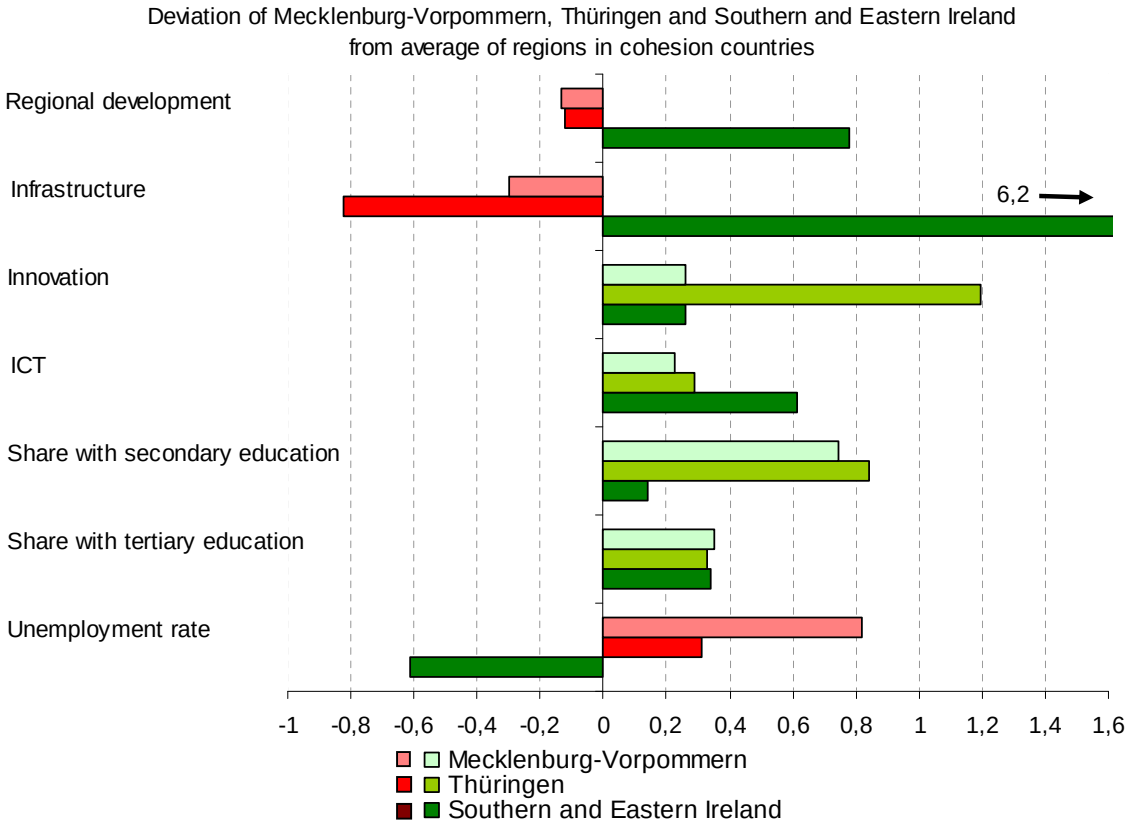
Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.

We have tried to test differences between high tech, medium tech and low tech manufacturing, but unfortunately this very detailed subdivision does not give any reliable results due to the low number of observations.

As a final exercise in understanding the factors attracting FDI in cohesion regions, we turn to cases of regions with above-average FDI stocks.[24] The two regions that have been selected are Southern and Eastern Ireland and Thüringen and Mecklenburg-Vorpommern. Figure 20 shows the relative strengths and weaknesses compared to all the regions in the cohesion countries.

[24] More precisely: Above-average FDI *after* controlling for the factors included in the econometric model.

Figure 20: Regional attraction factors of Mecklenburg-Vorpommern, Thüringen and Southern and Eastern Ireland relative to the average of regions in the cohesion countries



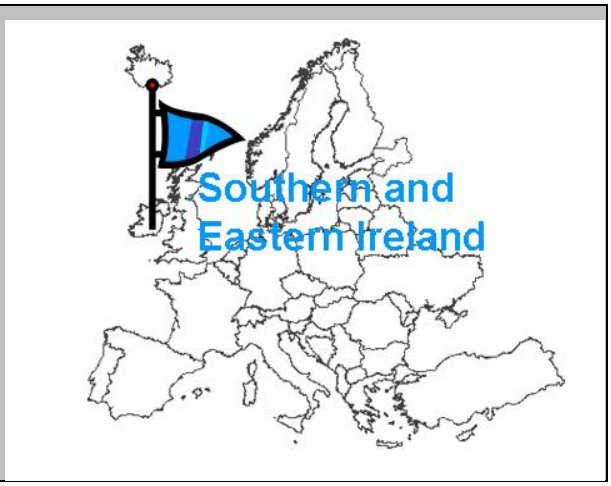
Source: Copenhagen Economics

Note: The regional attraction factors are reported as the difference to the average of regions in the cohesion countries divided with the regional average in the cohesion countries. Green colours represent a better situation than the EU27 average whereas a less attractive situation is reported in red colours.

Even though there are considerable strengths in especially Southern and Eastern Ireland but also in both Thüringen and Mecklenburg-Vorpommern, we know that this cannot explain all the foreign direct investment coming into these regions. There are regional characteristics which we have not taken into account. Thus, Box 7 and Box 8 supplement the empirical analysis with additional information about Southern and Eastern Ireland, Thüringen and Mecklenburg-Vorpommern.

Box 7. FDI in Southern and Eastern Ireland

The economic collapse in the late 1950s brought fundamental and far-reaching policy changes in all of Ireland. Free trade was adopted and the prohibition on foreign ownership of firms operating in Ireland was replaced by a policy that systematically cultivated FDI. During the 1990s, there was an important change in focus of the activist policies away from manufacturing industries and towards internationally-traded services and high-tech products. Alongside this strategy, Ireland has put great emphasis on upgrading the human capital of a labour force, which at the beginning of the 1960s



was falling seriously behind in most international comparison, but is now one of the best educated in Europe. The immediate result has been a large inflow of FDI into Ireland, and especially the Southern and Eastern region, such that the country is now ranked 7th on the list of FDI recipients globally (2005 figures)[1] – a position much higher than the size of Ireland implies.

Based on the success of attracting FDI through the last decade, observers conclude: "…after approximately 40 years of development and capacity building [Southern and Eastern Ireland is] ready to move on to a phase where the quality of living can be improved."[2] Clearly, Ireland has shown how commitment to growth-enhancing economic policies, will be rewarded in the long run. Examples of such growth-enhancing policies are fiscal prudence, the maintenance of labour market flexibility and a focus on science-oriented human capital formation.

In fact, a survey conducted among foreign investors 2002-2005 shows that education seems to be the most important reason for business executives to invest in Ireland, c.f. Table 4.5. Also support from the Irish inward investment agency (IPA) and regulations are high-scoring. At the same time, it is worth noticing that executives are much less interested in the low Irish corporate tax rate suggested by many observers to play a major role.

Table 4.5. Motives for investing in Ireland

Motive	%	Motive	%
Skilled workforce availability	29.60%	Proximity to markets or customers	7.20%
IIA or Govt support	10.50%	Industry Cluster / Critical Mass	5.30%
Domestic Market Growth Potential	9.20%	Language Skills	4.60%
Regulations or business climate	7.90%	Infrastructure and logistics	3.90%
Finance Incentives or Taxes or Funding	7.90%	Universities or researchers	3.30%

Source: LOCOmonitor (2005)

The same picture emerges, when we start looking into statements given by the people responsible for some of the major investments and the Dublin area. For instance, John Marcom, Senior Vice President of Yahoo, expressed the following view when establishing the European Operations Headquarters in Dublin, February 2005:

"Our decision to locate the European Operations Headquarters in Ireland was influenced by several factors - the success of our existing operation in Dublin; the calibre and volume of graduates available in Ireland; the up-to-date and cost competitive telecommunications and data centre infrastructures and the assistance of IDA [the Irish IIA] Ireland."

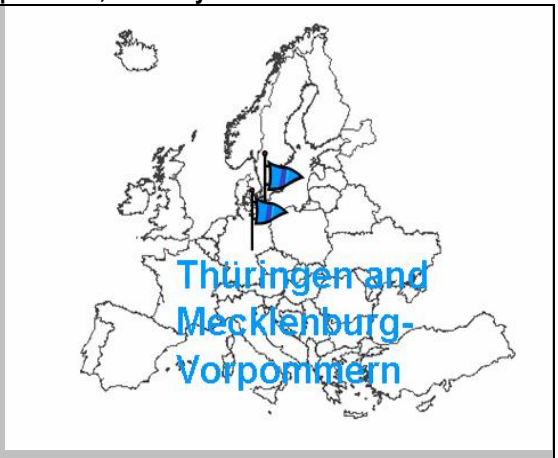
Another key component in the success of Southern and Eastern Ireland lies in the focus on exports. Many foreign investors, in particular the US investors, view their first investments as a window to the entire European market. This window has been held open by regional and central Irish policy makers supporting export-oriented firms, and today Ireland ranks 3rd in the world with respect to exports of services; it is ranked 1st with respect to software export.[3]

One of the major challenges for Ireland is to move away from the highly concentrated FDI structure today to promote regional growth in areas located further away from the Dublin region. Indeed, the Irish case is also an example of how FDI will tend to cluster in certain regions giving rise to very different regional economic climates.

[1] LOCOmonitor (2005).
[2] Krueger (2006).
[3] Barry (2004).

Source: Copenhagen Economics

Box 8 FDI in Thüringen and Mecklenburg-Vorpommern, Germany



After the German reunification in the 1990s, Eastern and Western Germany became one market. The huge differences between the two parts of the countries set the stage for new challenges as well as new possibilities for all East German regions. In general, all East German regions have succeeded in attracting foreign direct investments in addition to the huge amount of investments from West German regions.[1]

This case study describes two East German regions; Thüringen and Mecklenburg-Vorpommern. Even though, they are very different, they have both succeeded in attracting the necessary capital for restructuring, and their stories actually look quite similar. The investment incentives and active investment promotion agencies have helped them attract foreign direct investments, but it is the underlying regional characteristics that keep the investments in the region and thus helps create industrial specialization.

The two East German regions, Thüringen and Mecklenburg-Vorpommern, are characterised by a flexible labour market, compared to the rest of Germany. They also have a highly educated labour force with a moderate wage level. A central geographical position in the middle of EU27 as well as very good infrastructure due to railways, highways and network communication facilities are pointed out as another key component in the success of attracting foreign direct investments.

According to the investment agencies, foreign companies especially see the region as a part of the large German market. Regions as Thüringen and Mecklenburg-Vorpommern are thereby relevant investment objects for companies looking for a way to the German market where the costs are low compared to the old West-Germany. At the same time, the regions serve as a springboard for the international market, and especially to the internal market in EU.

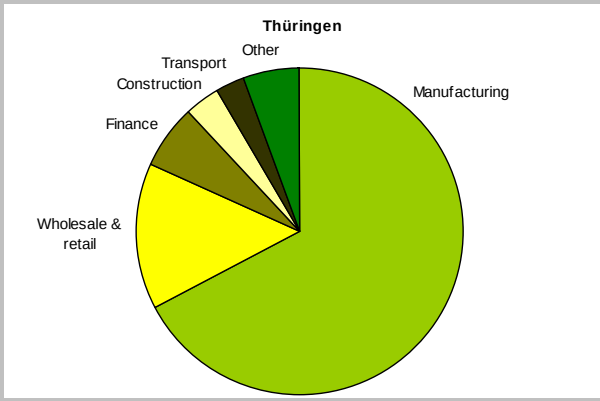
Top professional investment agencies are conspicuous in both regions. They both highlight the importance of a well structured and innovative investment agency together with the investment incentives in the East German regions as main factors in the process of attracting foreign direct investments. But in order to keep the foreign direct investments in the region, it is the regional characteristics that matters.

Even though, the two regions look very similar and agree on the most important factors in the process of attracting and keeping foreign direct investment, they have a very different industry structure.[2]

Historically, Mecklenburg-Vorpommern is a rural area, with low population density and is thereby not a part of the German industrial areas. However, Mecklenburg-Vorpommern has attracted many investors. Numerous high tech companies have been established during the previous years. For instance in BioRegion Greifswald-Rostock over 70 new companies with 1000 employees have started their business in the past few years. Due to a modern telecommunications network as well as a qualified, low cost workforce with good language skills, over 33 major call-centres with over 6000 telephone agents have also decided to locate in Mecklenburg-Vorpommern.[3]

Thüringen, on the other hand, has a more traditional industry structure. The main sectors are automotive industry, machinery, metal processing and plastics. As a consequence, the manufacturing sector has attracted about two thirds of the total foreign direct investment, c.f. Figure B8.1. The second largest sector in terms of foreign investments is wholesale and retail which only accounts for about 15 percent. Finance, which is the industry that has attracted most FDI to Germany as a whole with 36 percent, only makes up about 6 percent of the foreign investments in Thüringen. The rest of the sectors have each attracted 4 percent of total foreign direct investments or less.

Figure B8.1. Shares of total FDI for Thüringen on sectors



Source: Copenhagen Economics

Besides the specific manufacturing industries, other industrial strongholds in Thüringen include logistics, optical technologies like sensors, and biotech. Specialist knowledge within these sectors has formed the key to attract the foreign direct investment that has strengthened the same regional strongholds and created more high tech production. This creates several interesting business sites. As expressed by August Willhelm, the chairman of Board Lufthansa Technic with respect to the Erfurt Area:

"Erfurt emerged as the ideal location for our new engine maintenance centre due to its great labour pool, flexible labour framework, and first class support from the provincial government." 11,250 billion marks were invested in East Germany alone from 1991 to 1998, according to The Industrial Investment Council.

[1] http://www.iicgermany.com/index.php?&id=18&backPID=20&begin_at=180&tt_news=45&cHash=df0f571b39
[2] Telephone interviews with Director Dr Arnulf Wulff, LEG-Thüringen and Deputy Managing Director of the Economic Development Corporation Mecklenburg-Vorpommern, Waldemar Hoppe.
[3] http://www.gfw-mv.com/

Source: Copenhagen Economics

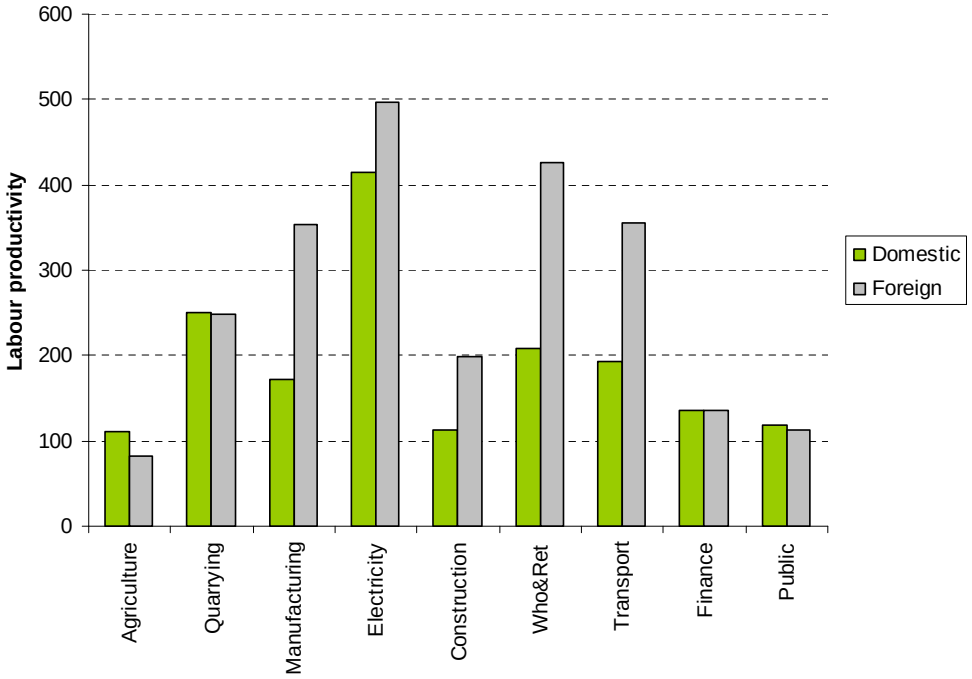
Altogether, the empirical modelling has shown that standard economic factors like market size, productivity level and nearness to other countries are the main explanatory variables of FDI location. We have also established that foreign investors follow a hierarchy in the decision process: first they choose country, then they choose region. Therefore constructing policies for FDI attractiveness is more than a regional matter.

4.2. Productivity spillovers in cohesion regions

Foreign direct investments could potentially exert a considerable positive influence on the economic development of European regions, especially on regions converging to the richest economies in Europe. Among these converging regions, we find the pre-2004 cohesion countries and East Germany.

For spillovers to arise, foreign firms entering the local markets normally have to possess certain competitive advantages which make them more productive than their domestic competitors. We have investigated this assertion for the regions of interest, and we do indeed find higher productivity for foreign firms, c.f. Figure 21. Especially, foreign firms are much more productive than their local counterparts in the manufacturing sector as well as in most services sectors.

Figure 21: Labour productivity of foreign and domestic firms



Source: Copenhagen Economics
Note: The figure shows the labour productivity, i.e. operating revenue per employee

The positive productivity impacts on regional economic development arise at the micro-level and for a number of reasons. Below, we give a non-exhaustive list of the possible transmissions mechanisms:

- forward and backward linkages to the subsidiary induce learning effects to local firms
- the subsidiary is a source of inspiration for its local competitors
- learning-by-doing in the subsidiary combined with job mobility between subsidiary and local firms creates knowledge diffusion
- increased competitive pressures reinforce the selection process of the most productive local firms

We have set up econometric models that measure the overall productivity spillovers for firms within the same industry as these are the most likely to be directly influenced. Furthermore, we have investigated the productivity impacts arising through backward linkages.[25] At the overall European level, we find considerable productivity spillovers in all sectors of the economy, and the same picture emerges when we try to measure the group-specific spillovers in the former cohesion countries, c.f. Table 4.6. Apart from the electricity-sector, our investigations show that spillovers are significantly positive in all sectors. The model has been cross-checked by applying a range of estimators and a range of formal specifications, and the results were very robust.

[25] The technical documentation of the model and detailed results can be found in Appendix C.

Table 4.6: Average within-industry productivity spillovers for a given sector, cohesion regions

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Productivity spillovers from FDI	+	+	+	ins-	+	+	+	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The estimated coefficient represents the average within-industry effect of increased FDI on labour productivity. Spillovers between industries in the same sector, e.g. manufacturing, have not been included.

But where are the largest spillovers? To answer this, we look at the size of the spillover as represented by the econometric coefficient estimate. The estimate can be interpreted as the percentage change in the productivity of the last local firm when foreigners completely overtake the local industry. Or put more simply, the coefficient measures the maximum spillover potential. Thus, if we multiply the coefficient with the actual FDI intensity in the industry, we obtain the effective productivity gain in local firms due to FDI. Generally, the spillovers in the former cohesion countries are very similar to those measured at the pan-European level. The econometric estimate in general has a meaningful economic size of around 0.4, i.e. that local firms are approximately 40 % more productive if they are surrounded by competitive foreign subsidiaries, c.f. Figure 22.

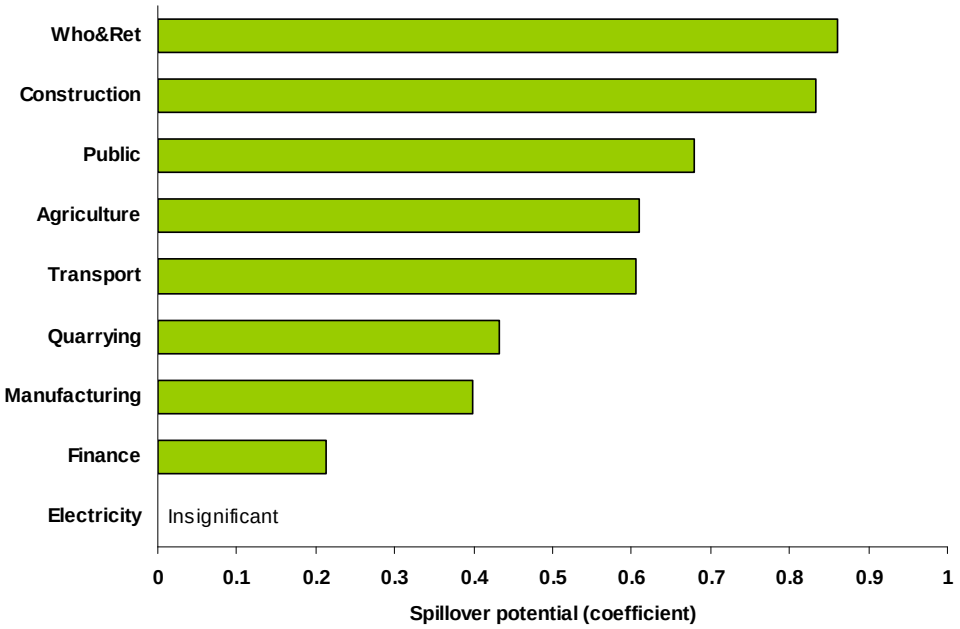
Moreover, spillovers seem to be slightly higher in services sectors than in manufacturing. At the same time, it should be stressed that (as all econometric estimates) the spillover coefficients are subject to uncertainty, whereas the overview of statistical significance may provide a more reliable picture. In particular, the sector coefficients from Figure 22 do not have a common standard error implying that if high impacts are identified from visual inspection we do not necessarily have high coefficients *with the same level of certainty*.[26] For example, the wholesale and retail sector has a confidence band 20 times higher than manufacturing.

We should also highlight that according to our empirical models, this group of regions has also experienced significant spillovers through backward linkages.[27] This implies that there is learning effects between industries – certainly for the industries most closely related. Thus, looking solely at the same industry as in the regressions above, we would tend to underestimate the total productivity spillovers.

[26] In particular, we make inference on quite diverse sample sizes across sectors.

[27] The results can be found in Appendix C.

Figure 22: Size of average within-industry spillover coefficient across sectors, cohesion regions



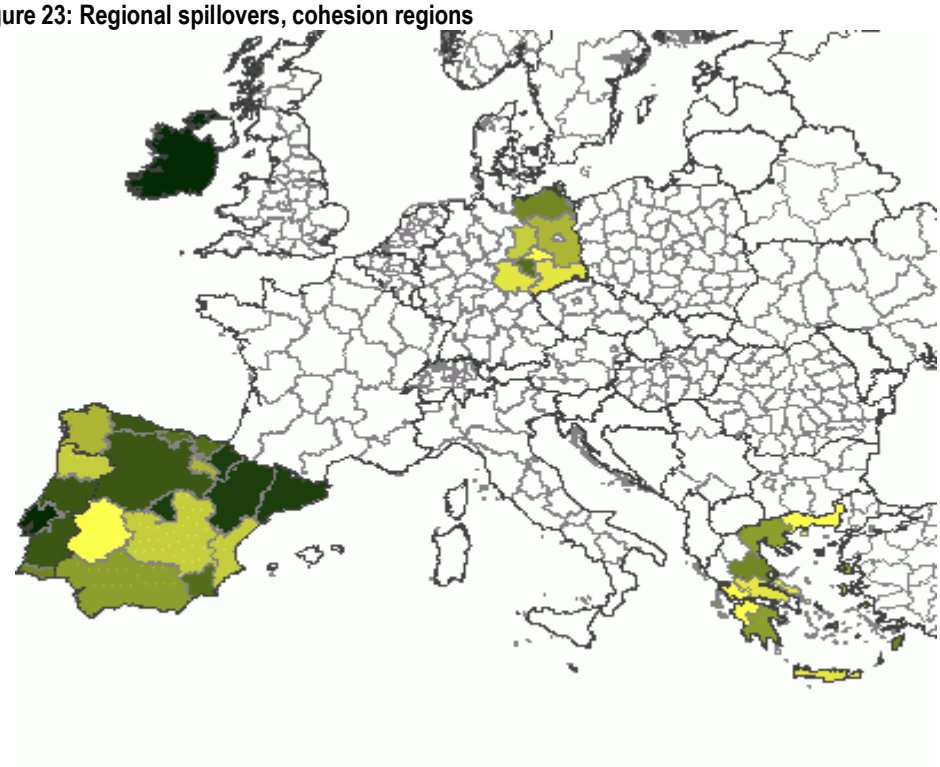
Source: Copenhagen Economics
Note: The figure displays the spillover coefficient for each sector.

Finally, we want to assess which regions have benefited the most from foreign direct investments in terms of productivity spillovers. That is, we are no longer interested in firm level impacts, but the effect on the entire regional economy. Formally, this aggregate effect has been calculated by adding the results from each sectoral model together.[28]

As a result of this exercise, we can appoint Ireland as the biggest winner in the quest for spillovers; not only has it experienced immense FDI inflows, but also into the industries generating the largest economic benefits, c.f. Figure 23. Also the Portuguese capital and northern Spanish regions have benefited significantly from FDI. On the other end of the scale, we find Greek and East German regions; the latter probably being underestimated as West German investments have been considered domestic (and not foreign), although spillovers certainly also arise from such investments.

[28] Technically, we have used the econometric models to predict the spillovers, and then weighted the results together according to sectoral weights.

Figure 23: Regional spillovers, cohesion regions



Source: Copenhagen Economics

Note: The figure shows the predicted size of all spillovers in each region. Darker green represents higher spillover impacts. The impacts have been calculated by weighting the products of spillover coefficient and sectoral FDI together to an aggregate regional spillover impact.

4.3. Impacts from FDI on labour markets in the cohesion regions

This section takes a closer look at the short- and long-run – or direct and indirect – effects from FDI on employment. We have set up a three-step methodology to analyse the direct and indirect effects of FDI inflows on labour demand; first we look at effects from takeovers, in the second step we turn to employment responses from local competitors, and in the third step we turn to a more aggregate regional perspective. Other aspects of labour market impacts can more or less be deduced from the conclusions on productivity spillover since productivity itself is an important determinant of labour market conditions. E.g., as productivity increases, so will the wage level.

Mergers & Acquisitions model

In the first step, we examine the direct effects from a foreign takeover of an already existing local firm. It could be argued that foreigners provide more and better capital to the local subsidiary, which would eventually influence firm level employment positively. At the same time, it could be argued that foreigners are quick to lay off redundant workers, which would impact employment negatively. By setting up an econometric model focussing entirely on mergers and acquisitions (takeovers), we have derived consistent conclusions regarding the employment issue.[29]

The general result, when including firms from all over Europe, is that foreign takeovers tend to reduce labour demand immediately after the takeover. We have estimated that labour demand is reduced by around 2 % after the foreign takeover.[30] But for firms belonging to the former cohesion countries, the effect is much less pronounced. Formally, we only find a minor downward pressure of less than 2 %, and the effect is no longer significant. In other words, the

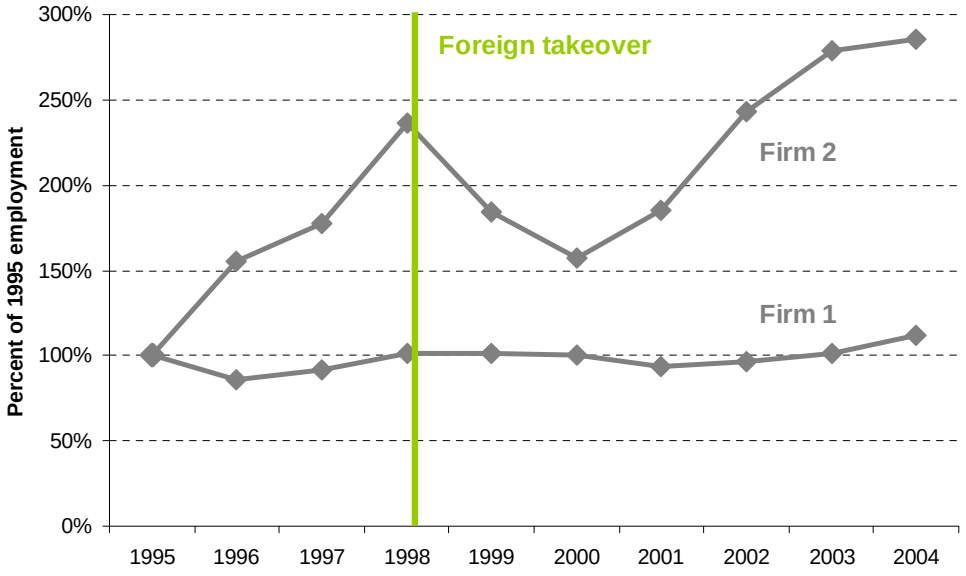
[29] Details of the model and detailed results can be found in Appendix C.

[30] See Appendix C, Stata Output 4.

restructuring effect could be significant in some firms, but in other firms the effect is opposite and the statistical model is not dominated by either.

We have depicted the development in employment over time for an East German and a Spanish firm both being subject to a foreign takeover in 1998, see Figure 24. Though quite different in their development, both firms comply with the overall model results. The first firm has simply not been affected by the takeover, whereas the second seems to have undergone some restructuring in the first two years which has prepared the ground for the later growth. In both cases, the net impact across the period after the takeover will be close to zero. Unfortunately, we do not possess time series long enough to get a reliable insight into the long run effects.

Figure 24: Development in firm employment before and after takeover



Source: Copenhagen Economics

Note: The figure shows the development in employment in a typical firm being acquired by foreign investors. The graph is based on actual data, but the firm's identity has been covered by indexing the development to the 1995 employment figure.

Labour effects within industry

In the second step of the labour market impact analysis, we see how the local competitors respond to the presence of foreign subsidiaries. There are several reasons to suspect that the impact should be negative in the short- to medium-run, but we should also remember that increased productivity among local firms eventually creates more possibilities for local employees.

Our econometric analyses generally suggest that local companies reduce their labour demand if the industry has experienced any noteworthy foreign direct investments. The conclusion is the same whether we focus on firms from the former cohesion regions or firms from all of Europe: FDI decrease demand for labour in local firms within the same industry. The only two sectors where we identify positive impacts are agriculture and business services (finance), where the former is only a marginal recipient of FDI and therefore not completely reliable for econometric modelling, c.f. Table 4.7.

Table 4.7: Effects on competitors' (within industry) labour demand, cohesion countries

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Effect from FDI on competitors labour demand	+	ins-	-	-	-	-	-	+	-

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant.

At this point, we link the results from the productivity spillover analysis to the labour market results, i.e. that local firms from industries with a high share of foreign investors tend to be more productive, but also more reluctant to hire new employees. We have already mentioned the possibility that the entry of foreign firms exerts increased competitive pressures on local competitors thereby enforcing the dynamic selection process whereby the most inefficient local firms are forced out of the market. As these inefficient firms typically will be the most labour intensive (i.e. those with relative high labour demands compared to their characteristics), we also have an explanation for the reduced labour demand. This mechanism is more clearly illustrated in Box 5 in Section 3.3.

From an economic point of view, it is less clear whether the measured reduction in labour demand at the industry level is favourable or not. On the one hand, more productive and secure jobs seem to be created; on the other hand, temporary unemployment is a necessary evil on this path.

Regional labour demand effects

Up to this point, we have kept a rather narrow view on the labour market effects, but the effects of FDI to one part of the economy will knock-on to other parts of the economy and generate complex, dynamic effects. E.g., if one sector becomes more productive due to FDI, it will be able to deliver more goods and services – possibly at lower prices – to firms throughout the economy, and this will induce more production and more demand for labour in the rest of the economy.[31]

Therefore, we have constructed an empirical model investigating the overall regional employment effects of FDI, i.e. a model that includes the effects on the subsidiaries themselves, their competitors and all other firms in the region. The model brings encouraging news for all regions with high FDI stocks, except if the region belongs to the former cohesion countries, c.f. Table 3.8. In all other cases, we find that the positive effects from greenfield investments together with the positive knock-on effects more than outweigh the negative effects from takeovers and competitive restructuring.

Table 4.8: Effects on the regional labour demand

	Europe	Group 1	Group 2	Group 3	Group 4	Group 5
Effect from FDI on the regional labour demand	+	+	-	+	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of the spillover estimate. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. We present the results for instrumental variables regressions with country dummies.

[31] In Box 6 in Section 3.3, we provide a more detailed account of the interrelationships between the three employment models.

There might be several reasons for this finding: first, the positive knock-on effects have not yet materialised fully; second, the economic effects are too diverse among the countries belonging to this group to establish a reliable econometric model; and third, the FDI flows are undergoing some change in these countries at the moment as welfare (wages) has risen and as Eastern Europe has become an alternative for high-quality low-cost labour investments.

Chapter 5 FDI in regions facing weaknesses in competitiveness and employment

In this chapter, we consider the effects of foreign direct investments in the regions facing weaknesses in competitiveness and employment. This group of regions has been defined by scoring low on a combined measure of productivity and unemployment for the last three years. The group mainly consists of German, French, Italian, Dutch, Belgian and Austrian regions.[32]

In the empirical modelling below, we will, in the first step, go into details with the determinants of FDI, and in the next step we will investigate the externalities on the local economy arising from FDI. These externalities can be divided according to the effects on productivity and labour demand.

In our analysis of the group of regions facing weaknesses in competitiveness and employment, we find that national market size is an important factor in attracting FDI. At the regional level, border regions attract more FDI. Furthermore, we identify sectors where technological spillovers exist, but spillovers are much smaller here compared to e.g. Eastern European regions. The reason seems to be the much smaller scope for technology (knowledge) transfers.[33]

Moreover, we find that FDI also have effects on labour demand. For mergers and acquisitions we find, contrary to the other groups, a positive effect on labour demand. The within-industry effect on labour demand is less clear, but on the overall regional level, the effect of FDI on labour demand is clearly positive.

Before turning to the empirical modelling, we present some of the characteristics of FDI in the regions facing weaknesses in competitiveness and employment. We start by looking at the intensity of FDI in each region, c.f. Figure 25.

Compared to other regions considered in this study, the level of FDI inflows is relatively high (not seen in the figure); only the most competitive regions in Europe have significantly higher intensities. To some extent, the high level of FDI is explained by the fact that most of the regions considered here are near to national borders generally receiving more FDI.

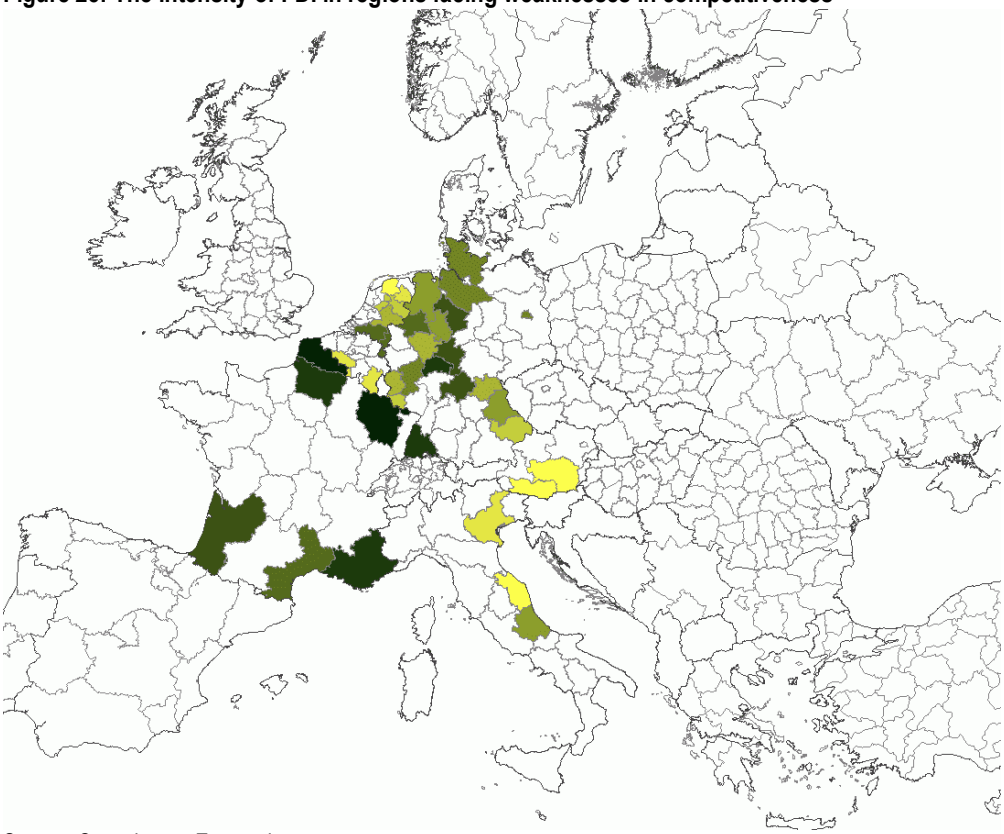
Looking at the intensities among the regions facing weaknesses in competitiveness, we see that the French and German regions have somewhat higher intensities than the remaining regions. This is in accordance with one of our main results of the empirical modelling: that

[32] The exact criteria for selection together with the exact list of regions can be found in Appendix A.

[33] The academic literature would apply the term “absorptive capacity” for telling that more developed regions have less to learn from foreigners.

regions belonging to large national markets like France and Germany receive more FDI simply due to the market size effect.

Figure 25: The intensity of FDI in regions facing weaknesses in competitiveness



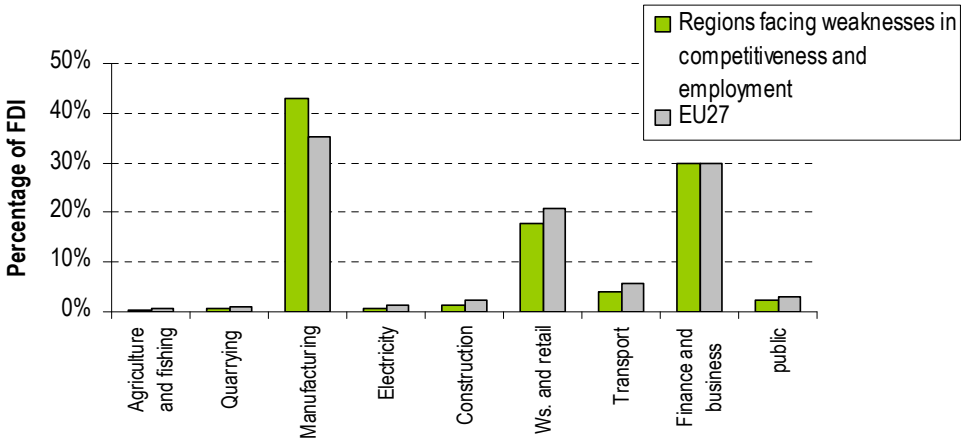
Source: Copenhagen Economics

Note: The map shows the intensity of FDI measured as the number of employees in foreign firms to total employees in the region. The darker green colour corresponds to higher FDI intensities.

We also look at the type of FDI received in the defined group. In particular, we have calculated the distribution of FDI inflows between sectors and compared it with the same distribution for total European FDI, see Figure 26.

Clearly, the distribution is quite similar to the average European distribution, although manufacturing appears to receive a slightly higher share of FDI at the expense of some services sectors. Actually, if we compare with the economic size of each sector, we would find that manufacturing is the most FDI intensive sector both at the overall European level and for the current group of regions. This is also why we have more confidence in the empirical results obtained for manufacturing whenever we subdivide the sample into different sectors. Conversely, the sectors receiving lower shares of total FDI are less reliable.

Figure 26: Distribution of FDI by sector

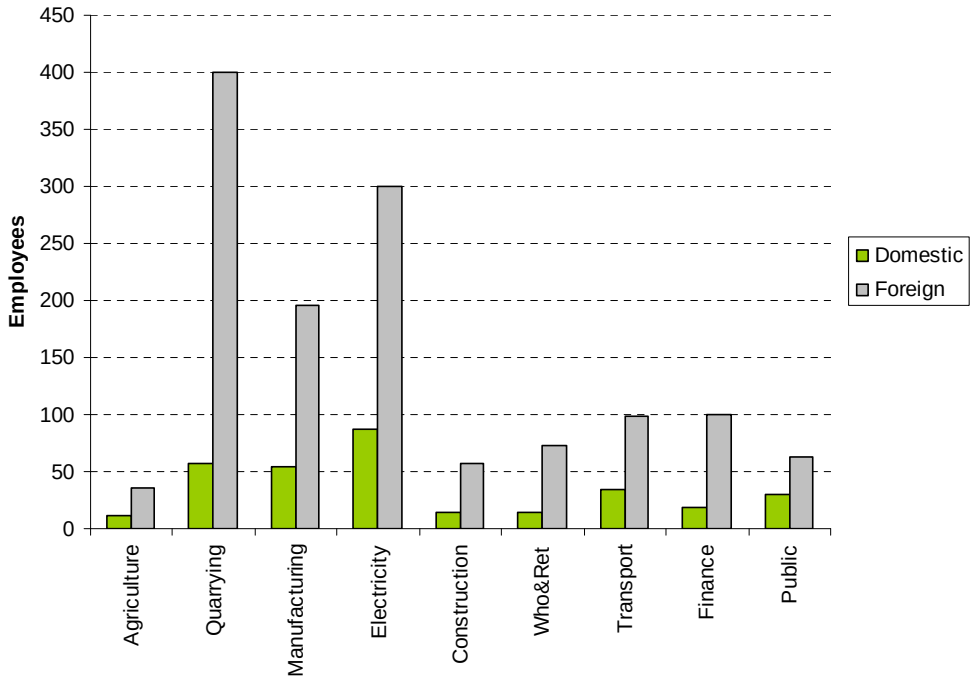


Source: Copenhagen Economics and the Amadeus database

From the geographical and sectoral aspects, we can assert that FDI is quite diversified: all regions become approximately the same share in both manufacturing and services. Thus, it can be difficult to describe the typical foreign subsidiaries in these regions.

Still, there are some facts that characterise the foreign subsidiaries. Most important of all, they are much larger than their domestic counterparts, c.f. Figure 27. The figure shows the average size of domestic and foreign firms in each industry calculated solely for the regions facing weaknesses in competitiveness.

Figure 27: The size of foreign and domestic firms across sectors, regions in group 3



Source: Copenhagen Economics

Most often, the foreign subsidiaries are several times larger and especially so in the sectors with the largest FDI inflows (manufacturing, wholesale and retail, and finance and business

services). This empirical fact would suggest that foreign firms are better at exploiting economies of scale than domestic firms. Concerning the possible productivity spillovers, we should therefore expect them to be higher in similar large-scale firms.

The rest of the chapter is organised as follows: First, we investigate what national and regional factors have been most successful in attracting FDI; second, we consider the productivity spillovers; and third, we try to quantify the impacts on employment.

5.1. Attracting FDI in regions facing weaknesses in competitiveness and employment

Our empirical studies have established that foreign investors choose their locations through a series of considerations. First they choose the country to locate in on the basis of certain national characteristics, and thereafter they look for the region with the most favourable characteristics within the chosen country. In the following, we split up the choice of location into these two steps in order to follow the decision structure of foreign investors.

Attracting FDI at a national level

We have set up and investigated a range of models to find a preferred model telling us how national characteristics affect the choice of location. Table 5.2 shows the results of this preferred model. The effects of different characteristics are investigated and reported. Plus and minus in the table should be read as effects increasing respectively decreasing the likelihood of receiving FDI. An insignificant effect means that a given variable have no effect on attracting foreign direct investment.

In order to explain the likelihood of attracting foreign direct investment, we find that *national market size* of the host country is very important in order to attract FDI. As already stated elsewhere in the report, the exclusion of national market size means a drop from 17 per cent to 8 per cent in the explanatory power of the model. This is clear evidence that the size of the national market is essential when multinational firms choose their location in the EU27. Said in another way, a firm chooses a particular country because it wants to get into a given national market[34].

We find that *national level of development* have a small positive effect on attracting foreign direct investments. The variable encompasses several different interpretations ranging from good infrastructure, high level of education, advanced consumers etc.

A high level of corporate *tax* rate leads to less foreign direct investment in a country. This means that by lowering the corporate tax rate and thereby improving the general conditions for companies, a country becomes more attractive to a foreign investor.

A high level of *English* language skills attracts foreign direct investment. This can be related to the fact that many multinational companies use English as their in-house business language as well as the fact that many foreign direct investments in Europe come from the US.

But even more importantly – for attracting foreign direct investments – is the communications between host and home countries. If *host and home countries have related languages,* they are often inclined to invest. This indicates the fact that communication between a parent company and the subsidiaries abroad or communication with the governmental authorities is important. In other words, the possibility to communicate in their own language makes things less complicated. Also, the variable could be a proxy for cultural similarity. Table 5.1 illustrates

[34] We have done the same on regional data but the regional market size does not affect the choice of region in the same matter as on a national level.

this effect on an overall level for this group of regions. Countries tend to invest more in a country near to home than other countries.

Table 5.1: Who invests in the regions facing weaknesses in competitiveness and employment?

The five most common home countries of investors				
Rank 1	***Rank 2***	***Rank 3***	***Rank 4***	***Rank 5***
USA	*The Netherlands*	*Belgium*	*Germany*	*Great Britain*

Source: Copenhagen Economics
Note: The largest investor (number of firms) is placed to the left.

Furthermore, countries with a low *national unemployment rate* attract more foreign direct investment. High unemployment rates indicate that labour markets are not functioning the way they are supposed to. It should be noticed that the level of unemployment only has a small impact on the level of foreign direct investments.

Table 5.2: The effect of national characteristics on attracting FDI

Explanatory variables	***Definition***	**EU27**
National market size	National GDP in latest available year (source: Eurostat)	+
Level of development	National GDP pr capita in latest available year (source: Eurostat)	+
Corporate tax	The national standard rate of taxation on corporate income (source: European Commission)	-
Proficiency in English	Percentage of population that speak English (source: Eurobarometer)	+
Unemployment rate	National unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-
Countries with related languages	Dummy variable: takes the value 1 if language of host and home country are the same for some part of the countries; zero otherwise. See appendix B for further information	+

Source: Copenhagen Economics
Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant
For detailed estimation information se Appendix C, Stata output 1

Attracting FDI at the regional level

Next we investigate how regional characteristics affect the ability to attract foreign direct investment. To compare regions from different countries on an equal basis, we eliminate the previously found effects from national characteristics. We conduct estimations separately for the entire EU27 sample, setting a benchmark, and the foreign firms in the regions of the group facing weaknesses.

For both EU27 and the regions facing weaknesses in competitiveness and employment, we find that a high *regional level of development* and regions with borders to other countries attract more foreign direct investment *(border regions)*.

Moreover, the modelling of regional characteristics shows that *regional industry clustering* and clustering of foreign firms *(*high *share of foreign direct investment)* attracts other foreign companies. *Regional monopoly structure* (i.e. the level of competition), in contrast, has no significant effect on the level of foreign direct investments.

On the other hand, there are differences between the overall results for EU27 and the regions facing weaknesses in competitiveness and employment. The effect of the *regional unemployment rate* is negative in the EU27 but has a positive effect in this group of regions.

Table 5.3: The effect of regional characteristics on attracting FDI

Explanatory variables	Definition	EU27	Group 3
Regional level of development	Regional GDP pr capita in latest available year (source: Eurostat)	+	+
Regional unemployment rate	Regional unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-	+
Capital city region	Dummy variable: takes the value one if a capital city is placed in a region and zero otherwise	+	
Regional industry clustering	Regional location quotient for each specific industry, measured as relative share of a specific industry in the region compared to the national share	+	+
Share of foreign direct investment	Share of foreign direct investment by region and industry	+	+
Regional monopoly structure	Herfindahl index: - high value: few firms and no competition - low value means many small competitors	-	ins-
Border regions	Dummy variable: takes the value one if the region is a bordering another country in EU27	+	+
Tertiary Education	Share of regional labour force with a tertiary educational level (source: Eurostat)	+	+
ICT	Share of firms with their own website	+	+
Infrastructure	Traffic in commercial airports	+	ins-
Innovation	Total intramusal R&D expenditure (share of GDP)	+	ins+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.
For detailed estimation information se Appendix c Stata output 2.

In our modelling, we include information on capital cities to find the effect of urbanization. *Capital city regions* attract more foreign direct investment than regions without a capital city in EU27, but the correction of capital cities are left out of the model since Berlin is the only capital in this group of regions. The proxy for infrastructure, number of passengers in international airports, does not have any significant effect on the level of foreign direct investments in the group.

Finally, we find that *level of education* matters. People with a high level of education have an impact on attracting foreign direct investments. Also the level of ICT has a positive effect, whereas innovation has no significant effect.

Sector estimation shows that manufacturing is equal to the effect on the EU27 all together; expect the level of education, which has no effect on the level of foreign direct investments in the regions facing weaknesses in competitiveness and unemployment, cf. Table 5.4. Furthermore, the estimated results for wholesale & retail, and finance in this group of regions look very similar to the overall results.

Table 5.4: Attracting FDI – differences across sectors

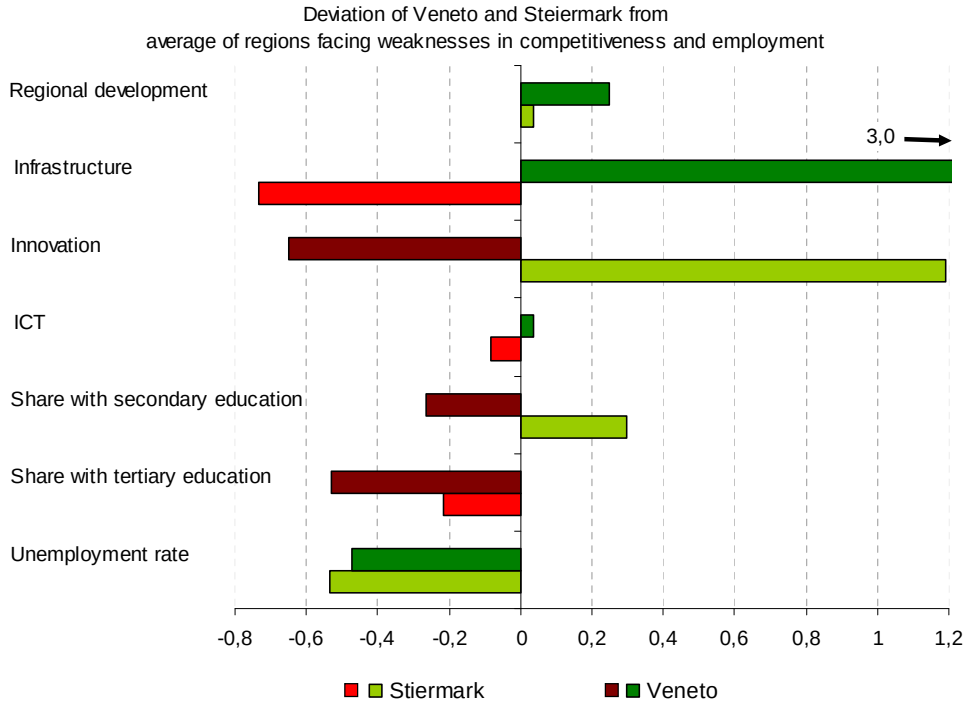
Explanatory variables	Manufacturing	Wholesale & Retail	Finance
Regional level of development	+	+	ins+
Regional unemployment rate	+	+	+
Capital city region	ins-	-	-
Regional industry clustering	+	ins+	+
Share of foreign direct investment	+	+	+
Regional monopoly structure	-	ins-	+
Border regions	+	+	+
Tertiary education	ins+	+	ins+
ICT	+	+	+
Infrastructure	ins-	ins-	ins-
innovation	ins-	ins+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.

Finally, in the quest for understanding regional FDI attractiveness, we turn to case study evidence. We have identified the Province of Veneto (IT) and Steirmark (AT) as best-practice regions among the group facing weaknesses. Figure 28 provides an overview of the regional attraction factors of the two regions. Veneto and Steiermark both have similarities and differences in their regional attraction factors. The unemployment rates are relatively low in both regions and they are underperforming with respect to highly educated people. However, there are important differences between the regions on other factors. With respect to infrastructure, innovation and the population share with a secondary education differences in performance do exist. Thus, the regions have different relative strengths and weaknesses too.

Figure 28: Regional attraction factors of Veneto and Steiermark relative to the average of regions facing weaknesses in competitiveness and employment

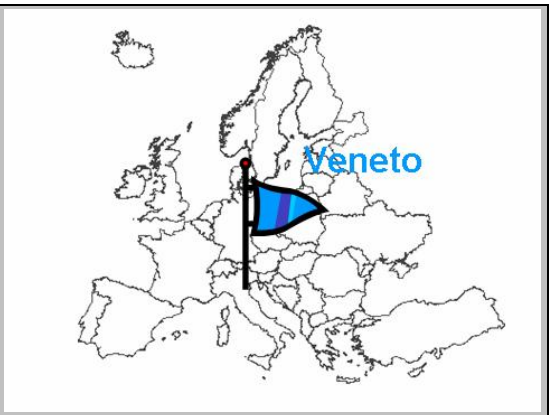


Source: Copenhagen Economics

Note: The regional attraction factors are reported as the difference to the average of regions in the Cohesion countries divided with the regional average in the Cohesion countries. Green colours represent a better situation than the EU27 average whereas a less attractive situation is reported in red colours.

The overall picture for Veneto is that the variable representing innovation together with education is lagging behind relative to other regions facing weaknesses. For Steiermark, the infrastructure seems to be a bigger issue. With these differences in mind, we will turn to the case studies of first Veneto and second Steiermark to find out what the model may not be telling about attracting and keeping foreign direct investment in the two regions.

Box 9: FDI in the Province of Veneto, Italy



Veneto is an example of a region where networks and clusters have been a key element in attracting and keeping FDI. The networks and clusters have also supported the development of a highly qualified and specialized workforce which is another attractive feature for possible investors. The geographical position near a large pool of deep-pocketed consumers in and outside of Italy has been a further advantage in attracting FDI to Veneto.

The networks and clusters have been among the main drivers in converting Veneto from an agricultural area into a rich, industrialized area in the years since World War II. And they are just as important in the creation of the Venetian growth industries of tomorrow: ICT, nanotech, and biotech. Moreover, the networks and clusters seem to be one of the main drivers in attracting and keeping FDI. It creates an attractive business environment that foreign companies can tap into and strengthen the parent firm by investing in the region.[1] According to a Porter based cluster analysis by Birkinshaw and Hood, the subsidiaries of multinational firms located in industrial districts such as Veneto tend to have higher value added and to be more oriented toward

international activities. This is confirmed by data from the regional investment promotion agency, Sviluppo Italia Veneto showing that around 70 percent of total production is exported. Furthermore, they tend to be better integrated into their local environment than firms that are not in such district.[2] Thus, FDI in regions like Veneto will tend to get better integrated in the local economy than places with less intra-industry cooperation.

Veneto is a region with several handcraft traditions that goes several hundred years back and has been refined through the years. Glasses of Cadore, furniture of Bassano, Cerea and Treviso, glass of Murano, fabrics and hosiery of Treviso and Vicenza, and shoes of lower Verona and long Brenta River are all examples of regional brands that triggers respect in the head of a quality-minded consumer all over the world. Other industrial strongholds have been added to the list through the years (like e.g. logistics, chemicals, refrigeration in Padua and electro-mechanics in Verona). This combined with a tourist industry with the highest tourist flow in Italy and, maybe most important, a transformation of business into more high-tech industries and more services, has made Veneto a region with a high level of business activity. According to Sviluppo Italia – Veneto, there are about 460,000 companies generating about 10 percent of the Italian GDP with less than 8 percent of the population of Italy. The unemployment rate is only 4 percent which is half of the Italian rate and there is a high import of foreign labour.

Clusters are a fundamental historic feature in the Venetian production system. Unlike many Italian and European regions, Veneto has only had few big companies but many entrepreneurs. Actually, it is one out of every ten inhabitants. Instead, the different industries in the region have based their competitiveness on networks of small and medium sized companies.

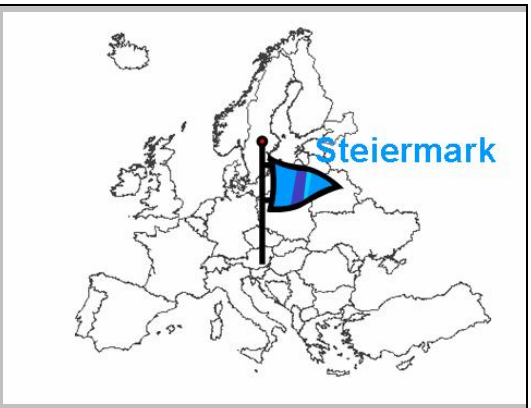
"[The] informal way of cooperation built up a genuine network of collaboration and sub-suppliers, and developed meanwhile a sense of belonging, which enabled both population and local enterprises to conceive themselves as collective actors, dealing with common problems and they became part of the local system. The birth of the division of labour system among enterprises combined with creativity and genius of Venetian entrepreneurs, determined the extreme specialization of quality products. The peculiar characteristic of Venetian clusters is the presence of highly specialized enterprises, mostly focused on manufacturing of a portion of final products, as niches of excellence." Sviluppo Italia Veneto, the regional branch of the Italian inward investment agency.[3]

The clusters are still creating a competitive advantage for the Venetian companies. In 2003, a regional law set up "the Venetian productive clusters" to meet the challenges of globalization. The initiative set up new standards for cluster work. It introduces new instruments devoted to growth and development in the 46 Venetian productive clusters and it brings together all the relevant regional partners in the innovation system from local financers to universities. One of the tasks of the clusters is self promotion which also means FDI promotion. The cluster work does not require any geographical proximity of the involved companies. In the last three years, the Veneto region has spent about € 50 millions to support the productive cluster and another € 18 millions will be available for 2007.

[1] Enright (1998). Regional Clusters and Multinational Enterprises: Independence or Interdependence? University of Hong Kong, School of Business, Working Paper
[2] Birkinshaw & Hood (1998). Roles of Foreign Subsidiaries in Industry Clusters. Institute of International Business, Stockholm School of Economics, Working Paper
[3] Telephone interview with Project Manager of Sviluppo Italia with responsibility for Veneto, Laura Speranza.

Source: Copenhagen Economcis

Box 10 FDI in the Province of Steiermark, Austria



According to the Austian Business Agency, the automotive sector employs as much as 60,000 in Austria – mainly in Steiermark – even though the wages are much higher than in other European regions. How is Steiermark able to keep the huge amount of FDI that is necessary to keep the metal processing industry at that activity level? Of course, the answer is not simple. But there are some crucial elements that form a picture of Steiermark as a relevant region for foreigners to invest in. And it all comes down to long lasting regional competences. The high productivity due to successful clusters and a qualified and loyal labour force under flexible regulation is essential but cross border market knowledge also creates a competitive advantage to other regions.

Most of the characteristics of Steiermark also apply for the rest of Austria. Compared to other European countries, Austria has among the most flexible labour market regulations. The labour force is generally qualified and there is insight about the markets in especially Germany, in Eastern Europe and in the Balkan Area in several Austrian regions. Furthermore, Austria has a loyal labour force which is critical for foreigners looking for long lasting business commitment. The tax level is relatively low on a European scale and there are ongoing investments in e.g. human capital to increase the competitiveness in the long run.

However, there are also regional characteristics that are specific for Steiermark. These are, however, often sector specific. With respect to the very large and thus important automotive industry, the main feature is that the cluster has become an international hub. In fact, it is known for its successful cluster model. Several studies have been made on the cluster and they generally find that Steiermark is a pioneer in using cluster policies to create a competitive position.[1]

"Building on high performing local enterprises in motor vehicle technology and gear units, a successful cluster of related companies has developed in this south-eastern province of Austria. The cluster currently has more than 120 companies, as well as a host of research institutes and technical colleges. Styria has used the cluster concept to create a 'brand name' in order to attract foreign direct investment in the automotive supply chain. The cluster concept has also helped to foster cooperation among local suppliers…" Dr Ross Brown, University of Strathclyde.[2]

Other prominent sectors in Steiermark are traditional industry sectors like agriculture, forestry, wood and paper processing and the challenged heavy iron and steel rolling mills and foundries. In some parts of Steiermark, tourism is also an important part of the economy. Most of the prominent sectors have attracted FDI. In connection with the privatization rounds since the 1980es there have also been some acquisitions by foreign companies. However, there is no doubt that the automotive industry is what makes Steiermark especially successful with respect to FDI compared to other Austrian regions.

[1] See e.g. Peneder (1999). Creating a Coherent Design for Cluster Analysis and Related Policies, in: Boosting Innovation. The Cluster Approach, OECD proceedings, Paris, pp. 339 – 359; Tödtling (2001). Industrial Clusters and Cluster Policies in Austrian Regions, in Cluster Policies – Cluster Development? Ed. Åge Mariussen, Nordregio; or Kaufmann & Tödtling (2000). Systems of Innovation in Traditional Industrial Regions: The Case of Styria in a Comparative Perspective. Regional Studies, Vol 34 pp. 29-40.
[2] Brown (2000). Cluster Dynamics in Theory and Practice with Application to Scotland. University of Strathclyde, Working Paper.
[3] Telephone interview with the Director of the Austrian Business Agency, Matthias Bruck.

Source: Copenhagen Economcis

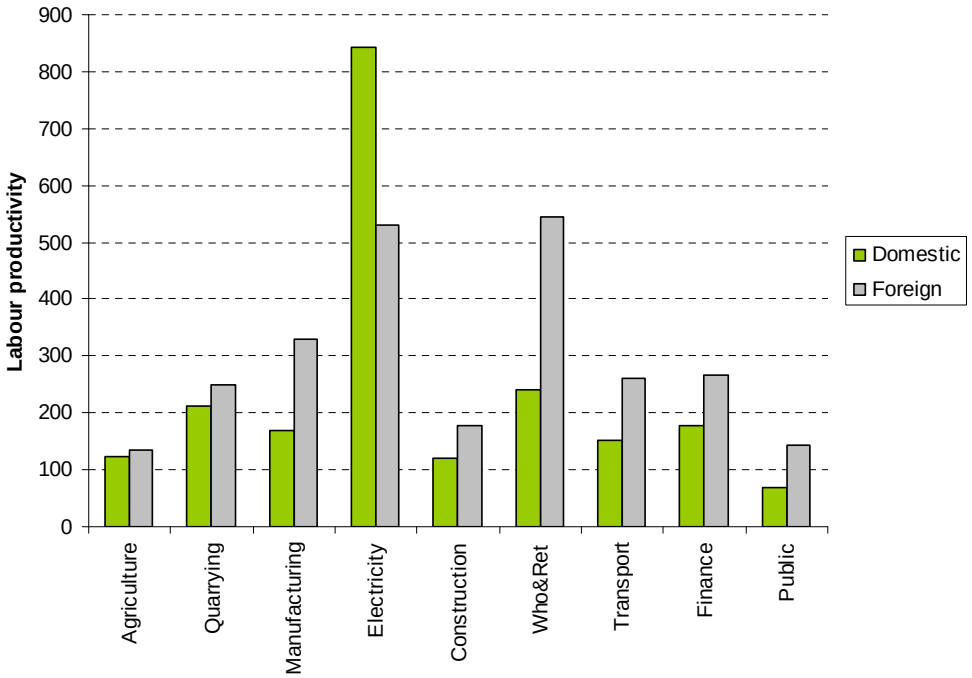
In summary, our study on attracting FDI shows that national market size is most important factor for attracting FDI. Furthermore we find that regional level of development together with border regions matter. The results for this group of regions are very similar to the overall findings for EU27.

5.2. Productivity spillovers in regions facing weaknesses in competitiveness and employment

In our empirical modelling we have also quantified the productivity spillovers arising in the industries experiencing foreign investments. But before turning to the actual results, we should account for the possible mechanisms through which the spillovers arise. Our working hypothesis is that the positive productivity impacts arise at the firm-level, and for a number of reasons, like forward and backward linkages between companies, induce learning effects to local companies. Another reason can be that the learning effects combined with job mobility between subsidiary and local firms creates knowledge diffusion and also inspire the local competitors. Finally, productivity spillovers could also arise due to the fact that increased competitive pressures reinforce the selection process of the most productive local firms.

A prerequisite for spillovers to arise is that foreign firms actually possess some kind of comparative advantage, be it of technical, managerial, planning, or any other kind. To get a grasp of the size of the advantage, we have compared average labour productivity between domestic and foreign firms, c.f. Figure 29. Obviously, foreign subsidiaries are more productive than their local counterparts, especially in manufacturing and most of the services sectors, e.g. wholesale and retail. The large discrepancies in labour productivity between sectors can mainly be explained by the differences in the use of capital, e.g. the electricity sector is very capital-intensive and therefore we presumably obtain much higher rates of productivity. In such sectors, the labour productivity measure may not be the most adequate.

Figure 29: Labour productivity of foreign and domestic firms



Source: Copenhagen Economics
Note: The figure shows the labour productivity, i.e. operating revenue per employee

Having established that foreign subsidiaries possess some kind of competitive advantage, we can now asses whether the entire industry succeed in copying and exploiting this advantage. We investigate the spillovers by the means of an econometric model.[35]

[35] Details of the model as well as detailed results can be found in Appendix C.

First, we would like to highlight the results of the model when we estimate on all firms from all European regions. We find very convincing evidence of productivity spillovers in all sectors of the private economy. We have also found that spillovers seem to be largest in the regions lagging most behind in economic development, i.e. Eastern Europe and most of the former cohesion countries, as they have the most to learn – the largest "technology gap". French, German, and Belgian regions facing weaknesses in competitiveness are much closer both geographically and economically to the countries/regions investing so the technological gap will be smaller.

This assertion is backed up by the econometric analysis. When we quantify the spillovers, we generally obtain positive impacts, but much less certain and less statistically significant than in other regions, c.f. Table 5.5

Table 5.5: Average within-industry productivity spillovers for a given sector, regions facing weaknesses

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Productivity spillovers from FDI	ins-	+	+	ins-	-	+	+	ins-	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The estimated coefficient represents the average within-industry effect of increased FDI on labour productivity. Spillovers between industries in the same sector, e.g. manufacturing, have not been included.

In the most important sectors, except business services (finance), we find positive spillovers. These are also the sectors being subject to the largest amount of foreign establishments, and therefore the sectors where the econometric models will be most reliable. In other sectors, we fail to find any spillovers and in one case, construction, we even identify a significant negative spillover. We believe that construction services do not have the largest potential for spillovers, but the negative sign might be an exaggeration. Most possibly, it is just a result of few observations and some outliers.

We also present evidence on the actual size of the spillovers. This size will be reflected in the econometric coefficient estimate. The estimate can be interpreted as the percentage change in the productivity of the last local firm when foreigners completely overtake the local industry. Generally, the spillovers are somewhat lower for the regions facing weaknesses in competitiveness than in the general case, c.f. Figure 30. Also, the econometric estimate in general has a meaningful economic size of around 0.4, i.e. that local firms are approximately 40% more productive if they are surrounded by highly competitive foreign subsidiaries.

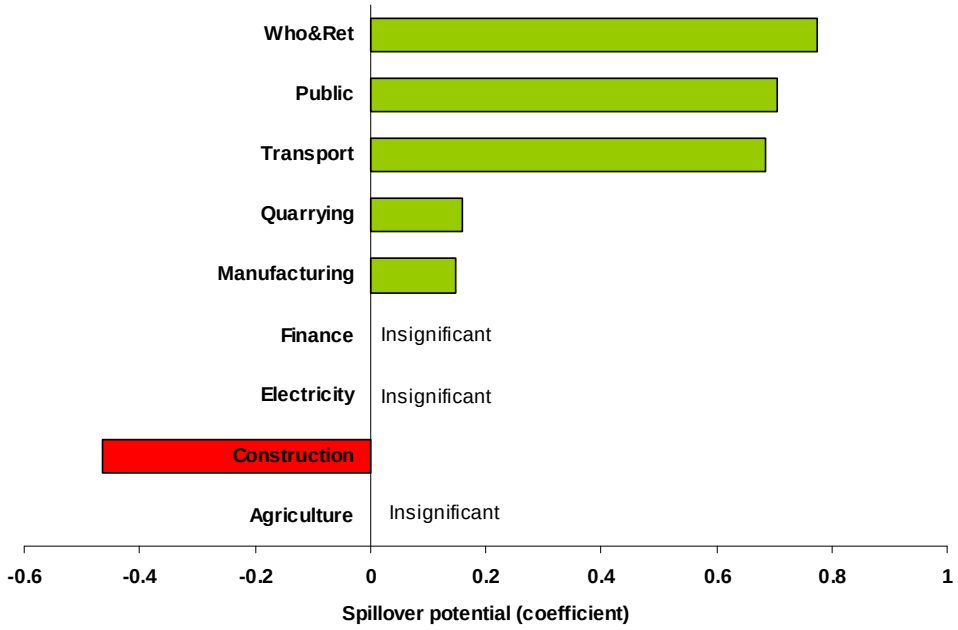
It is also worth noticing that spillovers seem to be notably higher in the same sectors where we found the highest ratio of foreign firms' productivity to domestic firms' productivity, c.f. Figure 29 above. Conversely, the sectors where foreign and local firms are more on an equal footing do not display particularly high spillovers.

At the same time, it should be stressed that the magnitude of the spillover coefficients are subject to uncertainty as all econometric estimates are, whereas the overview of statistical significance may provide a more reliable picture. In particular, all sector coefficients do not have a common standard error implying that if high impacts are identified from visual inspection we do not necessarily have high coefficients *with the same level of certainty*.[36] E.g., the confidence bands are more than 6 times larger in wholesale and retail than in

[36] In particular, we make inference on quite diverse sample sizes across sectors.

manufacturing for the group of regions facing weaknesses in competitiveness and employment?

Figure 30: Size of average within-industry spillover coefficient across sectors, regions facing weaknesses



Source: Copenhagen Economics

Note: The figure displays the spillover coefficients for each sector: first, as it has been estimated across all European firms; second, as it has been deduced for this group of regions.

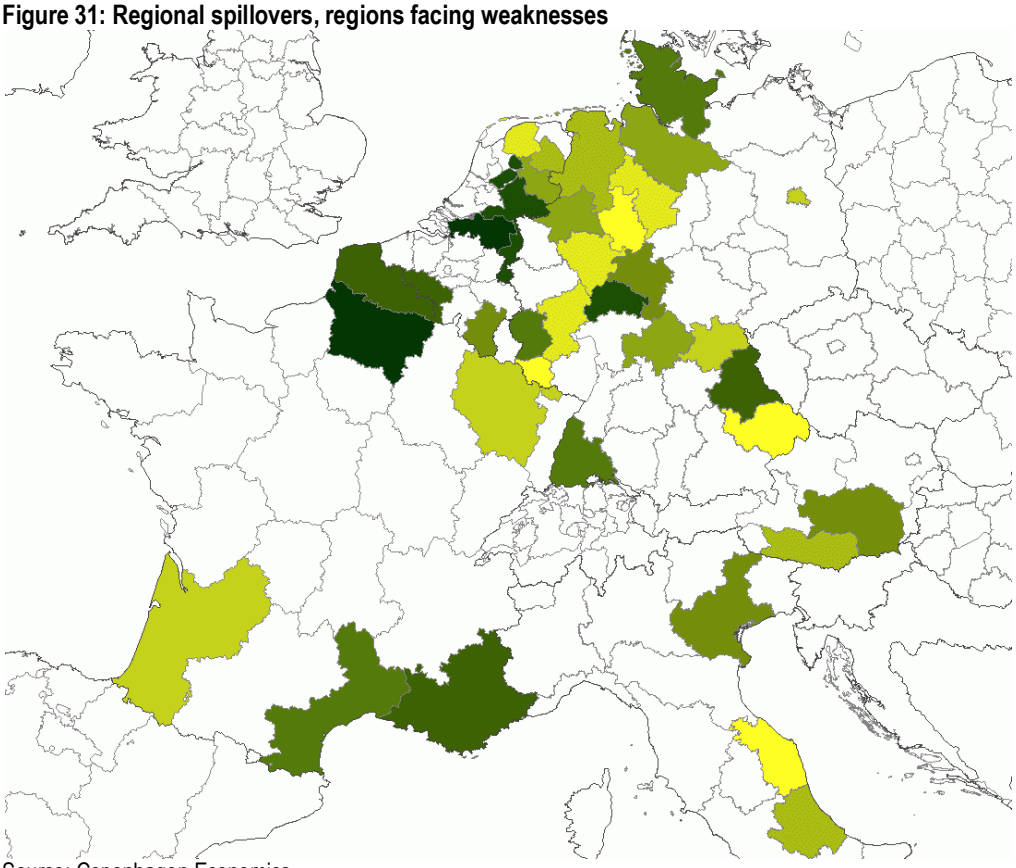
By the help of our econometric models, we can asses the aggregate effect on the economic development of each region. Formally, this aggregate effect has been calculated by adding the results from each sectoral model together.[37] We present the results in a map where the colours indicate the size of the aggregate spillovers, c.f. Figure 31.

What is not seen on the map is that there is an only minor difference in the overall economic benefits from foreign direct investments. Compared to other European regions, the regions facing weaknesses in competitiveness belong to the ones in the middle in terms of exploiting foreign investments. But still, the map below points to some diversity among the regions facing weaknesses in competitiveness; in particular, some of the Central German regions the effect of productivity spillovers have been limited

Summing up, we identify sectors where spillovers exist, but they are much less sizeable compared to e.g. Eastern European regions. The reason seems to be the much smaller scope for technology (knowledge) transfers.

[37] Technically, we have used the econometric models to predict the spillovers, and then weighted the results together according to sectoral weights.

Figure 31: Regional spillovers, regions facing weaknesses



Source: Copenhagen Economics

Note: The figure shows the predicted size of all spillovers in each region. Darker green represents higher spillover impacts. The impacts have been calculated by weighting the products of spillover coefficient and sectoral FDI together to an aggregate regional spillover impact.

5.3. Impacts from FDI on labour markets in regions facing weaknesses in competitiveness and employment

Alongside the productivity effects on firms, foreign direct investments will also influence the labour market situation. Through our empirical modelling, we have identified both direct and indirect effects on labour markets. By using the vast amount of information in our company database, we can show how labour demand responds to FDI.

As in the other groups, we proceed in three steps. First, we investigate the direct effect of foreign investments on the labour market, i.e. what happens when a firm is taken over by a foreign investor? The second step is to investigate the effect on the number of employees in domestic firms after a foreign firm has entered the local industry. Finally, we look at the overall effect including inter-industrial linkages.

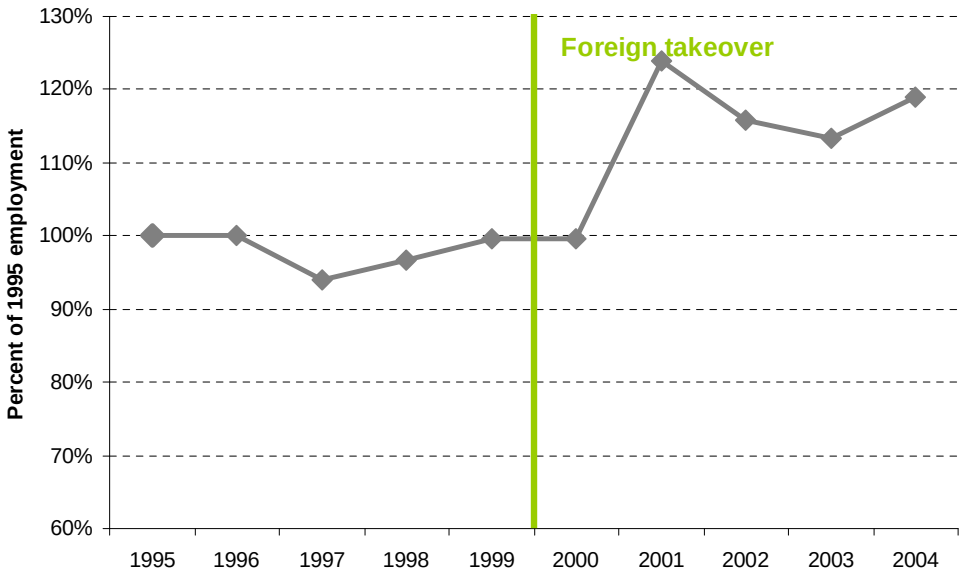
Mergers & Acquisitions model

Starting with the first step, we examine the effects of foreign investors acquiring an already existing local firm. Our econometric models[38] analyse whether foreign takeovers imply more or fewer jobs in the short run. We find that labour demand is reduced by approximately 2% on average after a foreign takeover if we consider all European takeovers. This effect is plus 5%, if we focus on mergers and acquisitions in regions facing weaknesses in competitiveness and employment.

[38] Details of the model and detailed results can be found in Appendix C.

That is to say, our empirical model of foreign takeovers establishes that the short-run effect is negative across all of Europe, but interestingly, the same conclusion does *not* hold if we look exclusively on firms in the regions facing weaknesses in competitiveness. In fact, employment seems to have risen in most firms after a foreign takeover. We have selected one of the French firms displaying this pattern, see Figure 32. After the takeover in the beginning of 2000, employment rose immediately with approximately 25 %, and it has more or less stayed at the new higher level. The 25 % effect is too large compared to the estimated 5 %, but illustrates the actual effect.

Figure 32: Development in firm employment before and after takeover



Source: Copenhagen Economics
Note: The figure shows the development in employment in a typical firm being acquired by foreign investors. The graph is based on actual data, but the firm's identity has been covered by indexing the development to the 1995 employment figure.

Labour effects within industry

In the second step of modelling labour market impacts, we consider the effects on local competitors. We have set up an econometric model investigating the local competitor response in terms of labour demand after foreign presence in the industry increases. There are reasons to believe that more foreign firms in an industry can both be stimulating and restricting labour demand; if productivity rises, production and exports will go up, but at the same time the industry might have become much more competitive, which forces a more careful use of labour (and capital) inputs.

In the empirical models, the latter effect clearly seems to dominate if we consider all of Europe, but less so when we consider the regions facing weaknesses in competitiveness, c.f. Table 5.6. In other words because these regions are running closer to efficient capacity utilisation a boost from foreign spillovers is transmitted more rapidly into increased labour demand. Actually, the two main recipient sectors of FDI, manufacturing and business services (finance), reveal significantly positive estimates, whereas less important sectors like electricity and public services are more in line with the general results.

Table 5.6: Effects on competitors' (within industry) labour demand

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Effect from FDI on competitors labour demand	+	ins+	+	-	ins+	-	ins-	+	-

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant.

Somewhat surprisingly, the results for labour demand only just align with the productivity spillover results. In other groups of regions, the results from the two "spillover models" conform to a much higher degree. In Eastern Europe and the former cohesion countries, competitive effects seem to have driven productivity up and firm level labour demand down. In the remote regions, the general lack of FDI implies very modest effects for both productivity and labour. But in the regions facing weaknesses in competitiveness, we can find all possible constellations of productivity and labour impacts depending on the sector of interest.

Due to this reason, we are somewhat more reserved to the interpretability of the econometric results. Only one thing appears to be more certain: the regions facing weaknesses in competitiveness have *smaller* FDI impacts on both productivity and labour than other regions.

Regional labour demand effects

So far we have only looked at the effects within the industries. But an effect in labour demand in one industry can affect the rest of the economy. E.g., if one sector becomes more productive, it will create an economic stimulus to firms throughout the economy, and this will induce increased production and labour demand in these parts of the economy.

Therefore we create an econometric model including the overall regional labour effect by including all sectors and domestic as well as foreign firms. We quantify the effects on the total regional labour demand. The aim with this exercise is to get an estimate of the overall job creating and job destructing effects including the knock-on effects on the industries experiencing less FDI. We have conducted econometric analyses on all of Europe as well as the defined groups of regions, and the empirical evidence suggests important positive effects, c.f. Table 5.7. This conclusion is valid for all European regions taken together and for the regions facing weaknesses in competitiveness solely.

Table 5.7: Effects on the regional labour demand

	Europe	Group 1	Group 2	Group 3	Group 4	Group 5
Effect from FDI on the regional labour demand	+	+	-	+	+	+

Source: Copenhagen Economics

Note: The table represents the sign and significance of the spillover estimate. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. We present the results for IV regressions with country dummies.

Box 11: The effects on regional labour demand

FDI has several direct and indirect effects on labour demand. In this study, we look at three levels: (1) the intra-firm effect of takeovers (Mergers & Acquisitions); (2) the within-industry effect from FDI; and (3) the net regional effect.

In this box, we emphasise that the net regional effect is *not* the same as the sum of the two former effects. First, we have not considered greenfield investments. These will always have a non-negative direct effect on regional labour demand. A new firm can never hire a negative number of employees. Second, we have not taken the productivity spillovers into consideration. Increased productivity will increase competitiveness and the positive effects will be transmitted throughout the economy and create new jobs in other industries and other sectors.

In the table below, we provide an overview of the various effects and their estimated signs (we have actually only estimated (1), (2), and (3), but the remaining effects can be deduced from (3)). The table shows the two (mainly) positive effects measured in the earlier stages of our labour demand analysis plus the positive contributions from greenfield investments and cross-industry knock-on effects. The net effect is therefore positive.

Table: The net effects of FDI on regional labour demand

	Effect on labour demand
(1) Merger & Acquisitions	+
Greenfield investments	+
(2) Within- industry effect from FDI on local competitors labour demand	+
Cross-industry effect from productivity knock-on effects	+
(3) Net regional effect	+

Source: Copenhagen Economics

Chapter 6 FDI in remote regions

This chapter presents the results of our empirical modelling of host country effects from FDI in the remote regions of Europe. The group of remote regions consists of sparsely populated, insular, and peripheral areas like southern Italy and northern Finland. This is in many ways a very inhomogeneous group as some are actually quite rich in terms of consumption whereas others are quite poor. Despite this heterogeneity, the regions have one thing in common: they do not receive any noteworthy FDI.

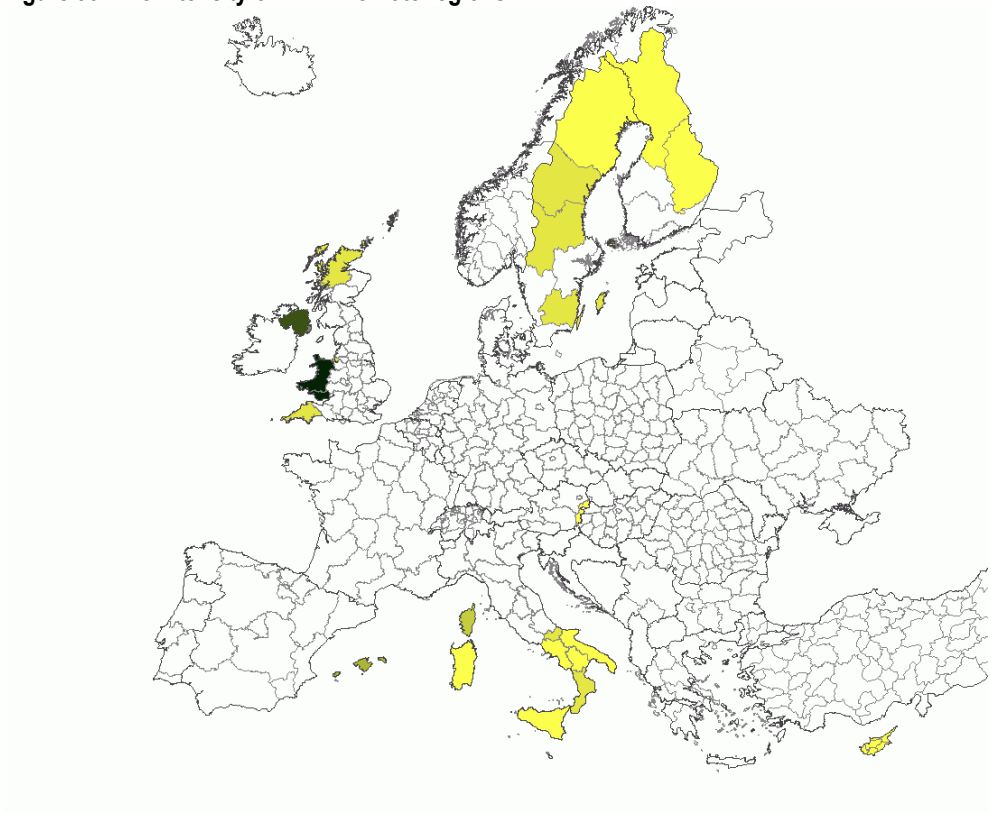
Due to the lack of FDI, the empirical analyses cannot give any decisive answer to the scope for economic growth effects. We simply cannot measure effects from something that has not happened. Therefore, reading through the following paragraphs, one could easily be drawn to the assertion that FDI does not possess any potential for driving regional development in remote regions. But we would like to emphasise that such conclusions are not consistent with the data material. The data says that we cannot measure what has not been, but it does not say that the potential for effects are not there.

Accordingly, the empirical investigations of what factors attract FDI become much more important in this chapter. The results are both promising and discouraging. We show that basic economic factors like market size and geographical distance are main drivers of FDI. The remote regions score low in all such areas. But we also show that a well-educated labour force, good command of foreign languages, open markets and a good infrastructure encourage FDI to locate in a certain region. The remote regions have possibilities for improvement in these respects – and so does most of Europe. The question is rather: who does it *first* and *best*?

We start the chapter by presenting some general characteristics of the (few) foreign investments. First, we look at some geographical aspects. We have used our large company-database to compute regional FDI intensities, measured as the number of employees in foreign firms to total regional employment, c.f. Figure 33. Except for some of the British regions, most notably Wales, FDI inflows are consistently low in the remote regions.[39]

[39] Yellow colours indicate low FDI intensities, whereas dark green colours indicate high intensities.

Figure 33: The intensity of FDI in remote regions

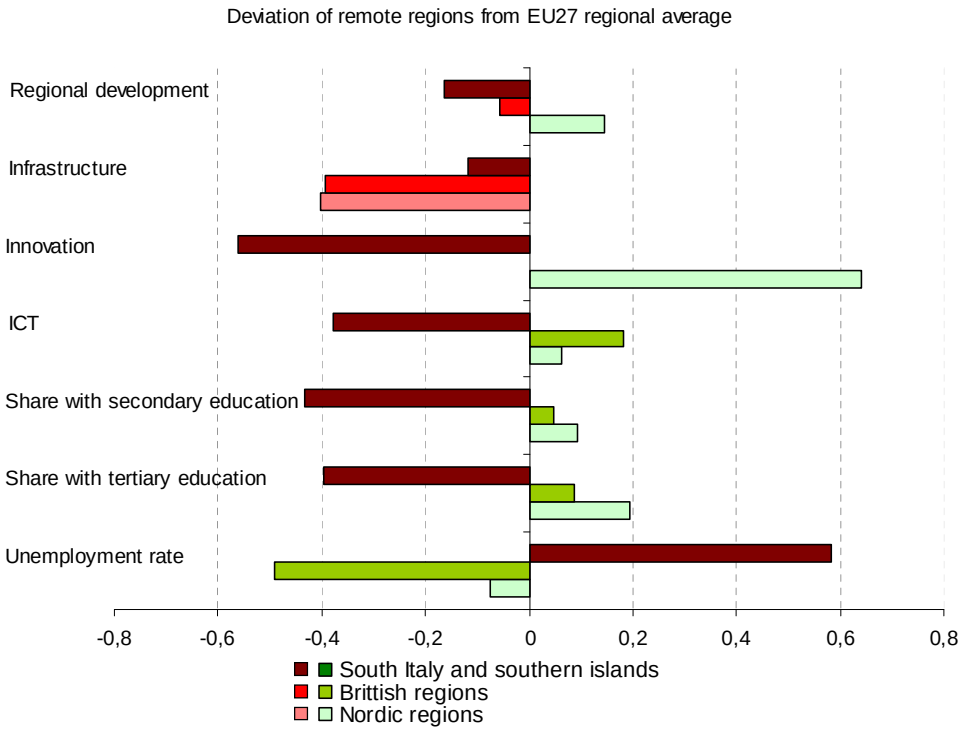


Source: Copenhagen Economics
Note: The map shows the intensity of FDI measured as the number of employees in foreign firms to total employees in the region. The darker green colour corresponds to higher FDI intensities.

When looking for the specific reasons for the low intensity of foreign direct investment in remote regions, two things seem to be important. First, the regional attraction factors are generally disadvantageous for the remote regions. This means that the remote regions will have problems attracting foreign direct investments compared with other regions in Europe.

For South Italy and southern islands, all the regional attraction factors are disadvantageous compared to the European level. The British and Nordic regions have better prerequisite conditions. Especially on the unemployment rate, the remote British regions are doing quite well and the same is the case for the Nordic countries when it comes to the level of innovation. Figure 34 shows that with respect to air infrastructure (number of passengers in commercial airports), the remote regions are all lacking behind and this may be an important disadvantage as it complicates the transportation for the business officers from headquarters.

Figure 34: Regional attraction factors of three groups of remote regions relative to the EU27 average



Source: Copenhagen Economics

Note: The regional attraction factors are reported as the difference to the EU27 regional average divided with the EU27 regional average. Green colours represent a better situation than the EU27 average whereas a less attractive situation is reported in red colours. Innovation data for the remote British regions is not available.

This line of reasoning is supported by the fact that there is a bias towards foreign direct investment from countries nearby where e.g. flight connections to the remote regions are better than for more distant countries. Thus, a large part of the foreign direct investments to remote regions are from countries from where the remoteness carries less weight; cf. Table 6.1.

Table 6.1: Who invests in the different groups of remote regions?

Host countries	The five most common home countries of investors				
	Rank 1	***Rank 2***	***Rank 3***	***Rank 4***	***Rank 5***
Nordic	*Finland*	*The Netherlands*	*Denmark*	*Germany*	*Sweden*
British	*USA*	*Ireland*	*The Netherlands*	*Germany*	*France*
South EU	*The Netherlands*	*Germany*	*France*	*USA*	*Great Britain*

Source: Copenhagen Economics

Note: The largest investor (number of firms) is placed next to the host country group, then the second largest and so on.

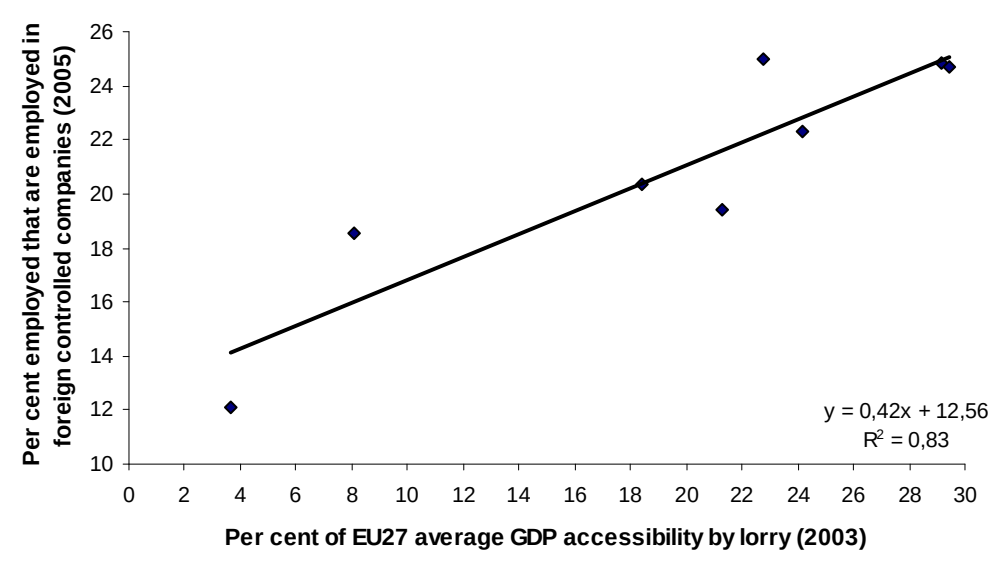
The second cause for a general low level of foreign direct investment in the remote regions is that other factors such as the road accessibility from the regions are discouraging investments. Both the home market and export markets can only be reached with higher transport costs relative to other regions in EU27. Box 12 illustrates this argument by looking at the accessibility from Swedish regions.

Box 12: Accessibility from regions and FDI in Sweden

There is a clear relationship between the accessibility to income creation (GDP) and the level of foreign direct investment in the region when we look at Sweden.

If we take the per cent employed people that work in foreign controlled companies as a proxy for the level of foreign direct investment, then the level is indeed influenced by the accessibility to GDP by lorry. The accessibility to GDP by lorry represents the perspective of producers on potential markets. It is calculated through a potential accessibility model that takes into account the travel time so that GDP has less value to a producer the longer time it takes to reach the market.

Figure: Plot of the regional accessibility and the regional percentage of employed in foreign controlled companies in Sweden



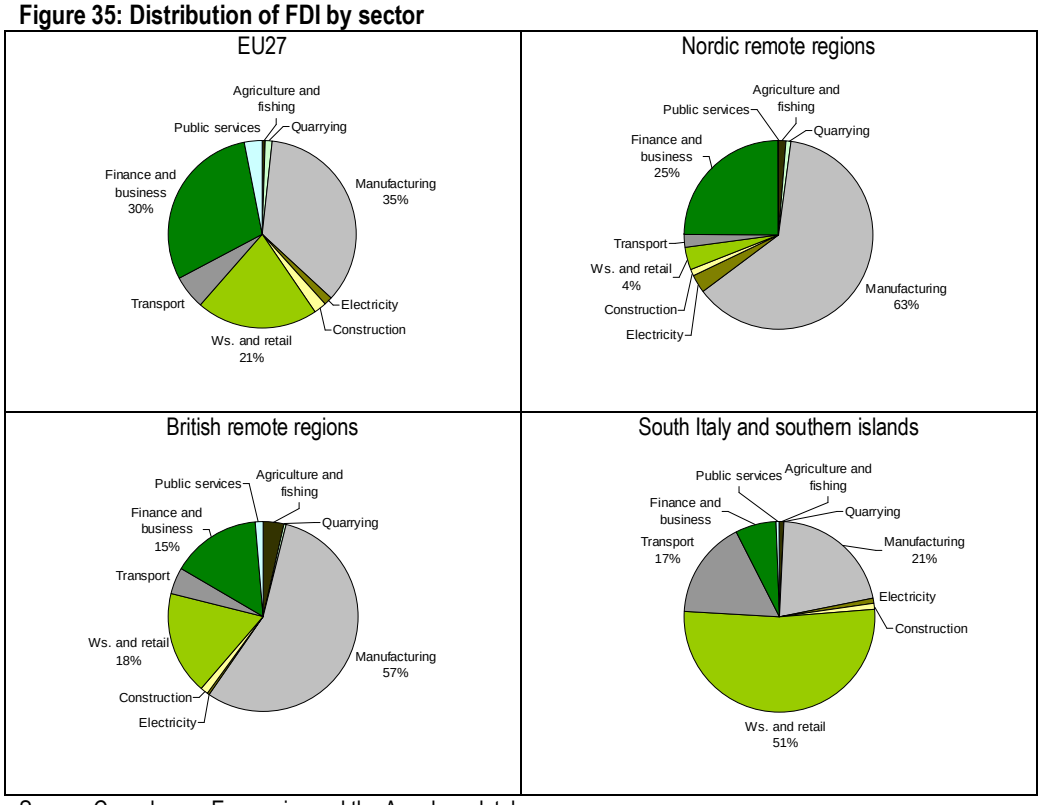
Source: Copenhagen Economics with data from ITPS (2006) "Utlandsägda företag 2005" and DG Regio.
Note: The explanatory variable is the potential GDP accessibility by lorry taking into account the travel time to different regions and thus markets. It is reported as a percentage of the EU27 average GDP accessibility. For further information about the accessibility index, see Schürmann and Talaat, 2000.

The positive relationship shown in the figure is significant and even if we remove the Swedish regions that are not remote, we get a coefficient of similar order.

Source: Copenhagen Economics

Despite the low level of FDI, we are still interested in knowing what kind of investments take place. For this reason, we have calculated the sectoral distribution of FDI in the remote regions together with a European average, see Figure 35. The two differ only in one respect: FDI is quite high in manufacturing and low in finance and business services for the remote regions. We would like to emphasise that this picture covers some large discrepancies between e.g. the remote regions in the Nordic countries and southern Italian regions.

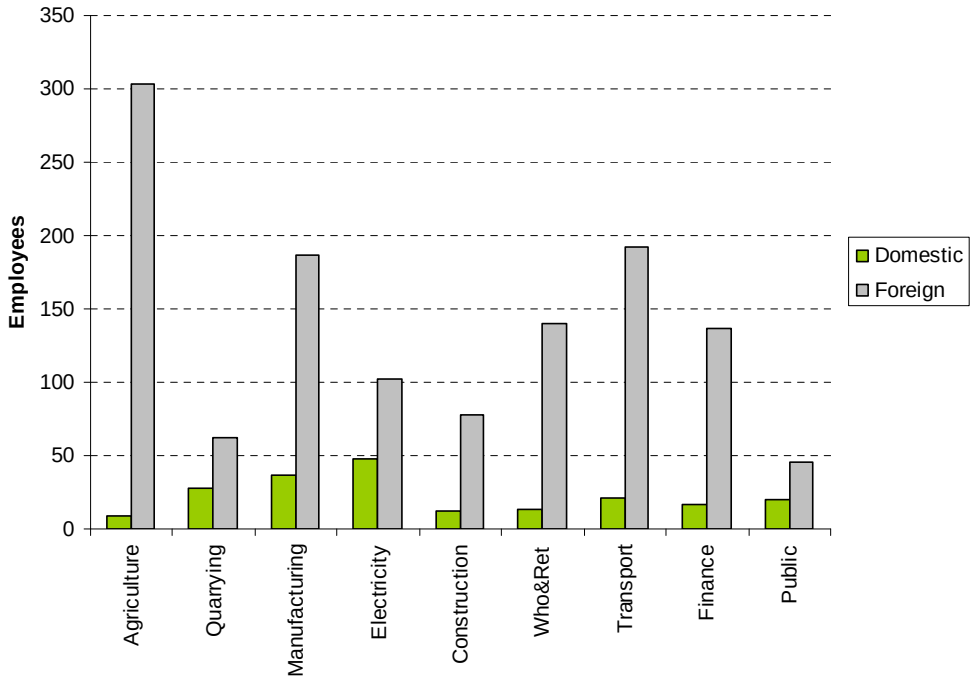
Figure 35: Distribution of FDI by sector



Source: Copenhagen Economics and the Amadeus database

We will also provide some insight into the characteristics of foreign subsidiaries. We have calculated the average firm size in terms of employees for foreign and domestic firms belonging to the remote regions, c.f. Figure 36. Clearly, foreign firms are much larger irrespective of which sector we are considering, and the relative proportion between the two types of firms is actually rather large compared to other groups of regions. The fact that the firms are so different could actually be hindering potential spillovers.

Figure 36: The size of foreign and domestic firms across sectors



Source: Copenhagen Economics

The rest of this chapter is structured as follows: in the first section, we account for the factors most important for attracting FDI; in the second section, we look at the measured productivity spillovers; and in the third section, we quantify labour market impacts.

6.1. Attracting FDI in remote regions

It has already been shown that the remote regions attract less foreign direct investment than an average European region. But is it only because of the remote location or does other regional characteristics affect the choice of location?

In this study, we attempt to account for the factors that make regions more attractive to foreign investors. We will investigate whether any of the remote regions, given their regional characteristics, attract foreign direct investment better than other remote regions.

Our empirical investigations have established that foreign investors choose their locations through a series of considerations. First, they choose the country to locate in on the basis of certain national characteristics, and thereafter they look for the region with the most favourable characteristics within the chosen country.

This two-step pattern, though, does not seem to be an adequate description of the decision structure for foreign firms locating in remote regions. Instead, it seems to be the regional factors, and only the regional factors, that determine the location choice. Firms locating in e.g. Northern Scandinavia do so because they are looking for very specific regional resources and not because they want to enter the Swedish or Finnish market. Thus, we turn immediately to the results of how regional characteristics attract – or repel – FDI.

Attracting FDI at the regional level

For the remote regions alone, as well as for all EU27, we find that the *level of regional development* attracts more foreign direct investment, and *regions bordering* other European countries are important, when a region wants to attract foreign direct investment.

Furthermore, we find that in remote regions as well as in EU27 in general, the high *share of foreign* direct investment attracts more foreign direct investment. *Competition* among firms in a region and the fact that there is not only one big firm controlling all of the market has a positive effect on the probability of attracting foreign direct investments. But due to specific *industry concentration* it has no effect on the remote regions. This can be explained by few industry clusters in the remote regions or the fact that the industry structure in these regions is very similar.

Notice that the effect on *capital city region* is only included in the overall model, due to the fact that no remote regions are capital city regions. But for all of EU27 we find that capital cities increase the probability of attracting foreign direct investment. This indicates an explanation of why remote regions normally have a lover level of investment due to European average.

The *regional level of unemployment* has a positive effect on the level of foreign direct investments in the remote regions as opposed to the EU27 altogether. If we are looking at the *level of education* it has a negative effect on the level of foreign direct investments as well as *infrastructure. Innovation* and *ICT* do not have any significant effect, probably because all remote regions have a very low and equal level of these two knowledge-factors.

Table 6.2: The effect of regional characteristics on attracting FDI

Explanatory variables	Definition	EU27	Remote regions
Regional level of development	Regional GDP pr capita in latest available year (source: Eurostat)	+	+
Regional unemployment rate	Regional unemployment rate measured as number of unemployed as percentage of total labour force (source: Eurostat)	-	+
Capital city region	Dummy variable: takes the value one if a capital city is placed in a region and zero otherwise	+	
Regional industry clustering	Regional location quotient for each specific industry, measured as relative share of a specific industry in the region compared to the national share	+	ins+
Share of foreign direct investment	Share of foreign direct investment by region and industry	+	+
Regional monopoly structure	Herfindahl index: - high value: few firms and no competition - low value means many small competitors	-	-
Border regions	Dummy variable: takes the value one if the region is a bordering another country in EU27	+	+
Tertiary Education	Share of regional labour force with at least a tertiary educational level (source: Eurostat)	+	-
ICT	Share of firms with their own website	+	ins+
Infrastructure	Traffic in commercial airports	+	-
Innovation	Total intramusal R&D expenditure (share of GDP)	+	ins+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.

Finally, we focus on the three largest sectors in the remote regions; manufacturing, wholesale & retail, and business & finance. Our econometric model allows a subdivision, but of course this means a reduction in the number of observations. Therefore, the precision of the models is decreased significantly. Table 6.3 indicates some differences among sectors. Share of foreign direct investment and the fact that bordering regions easier attract foreign direct investments

are the only general effects. The rest of the effects are difficult to explain in economic terms and are based on very few observations.

Table 6.3: Attracting FDI – differences among sectors

Explanatory variables	Manufacturing	Wholesale & Retail	Finance
Regional level of development	ins+	ins+	ins+
Regional unemployment rate	ins+	ins-	ins+
Regional industry clustering	ins+	+	+
Share of foreign direct investment	+	+	+
Regional monopoly structure	-	ins-	ins-
Border regions	+	+	+
Tertiary education	ins-	-	-
ICT	ins-	ins-	ins+
Infrastructure	ins-	Ins+	ins+
Innovation	ins+	+	ins+

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The complete output also includes coefficient estimates for the country dummies.

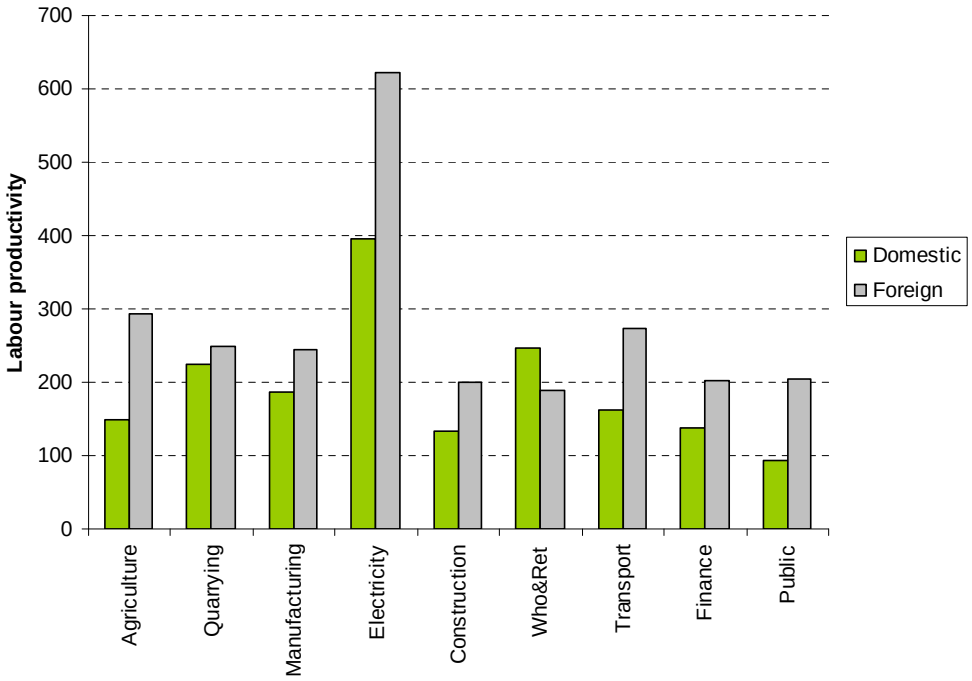
6.2. Productivity spillovers in remote regions

Foreign direct investments are generally thought to exert a positive influence on the domestic economy because of the specific knowledge it brings. Apart from a small (but probably increasing) share of foreign investments, the strategy behind establishing new subsidiaries around the world is not to gain new knowledge, but to exploit the core competences of the multinational in different markets. In other words, it should be expected that foreign investors possess genuine technical and/or managerial expertise that potentially could be copied by local competitors.

Using our large company-database, we have sought to quantify the advantages of foreign subsidiaries, see Figure 37. Clearly, foreign firms are more productive than their local counterparts, but the picture is quite different from other groups of regions. First, foreign firms are not significantly more productive; and secondly, the only sectors, where they actually are somewhat more productive, are agriculture, electricity and public services which are the sectors experiencing the least FDI. This alone would suggest that spillovers will not be of any important size.

But due to the geographical locations, we must also expect that the few foreign firms entering the local markets are primarily interested in selling to these markets. Therefore, we would expect that the subsidiaries put special effort into guarding their (small) competitive advantages. In other words, they will be particularly interested in diminishing any spillovers to competitors.

Figure 37: Labour productivity of foreign and domestic firms, remote regions



Source: Copenhagen Economics
Note: The figure shows the labour productivity, i.e. operating revenue per employee

Turning to the actual empirical modelling of spillovers, we find evidence for the above assertions. We have set up a consistent framework to assess spillovers across regions and sectors, and we find very significant spillovers in the rest of Europe.[40] Conversely, spillovers are non-existent or even negative in the remote regions. The spillovers we primarily consider are those arising in the same industry as the foreign investments take place, but we have also sought to estimate spillovers arising through backward linkages.

When we look at productivity spillovers at a pan-European level, we most clearly find significant positive results, i.e. that foreign firms tend to increase the productivity of local firms within the same industry. This result is not replicated when we focus our models on firms belonging to the remote regions of Europe. In fact, we generally do not find any spillovers at all, c.f. Table 6.4. The table gives on overview of the sign and statistical significance of spillovers in these regions.

Table 6.4: Average within-industry productivity spillovers for a given sector, remote regions

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Productivity spillovers from FDI	ins-	ins+	ins+	ins-	+	-	+	ins-	ins+

Source: Copenhagen Economics
Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant. The estimated coefficient represents the average within-industry effect of increased FDI on labour productivity. Spillovers between industries in the same sector, e.g. manufacturing, have not been included.

In most sectors, we simply cannot measure any spillovers, and in a few cases, we factually find significant negative spillovers – not surprisingly, the FDI-intensity was the lowest or the

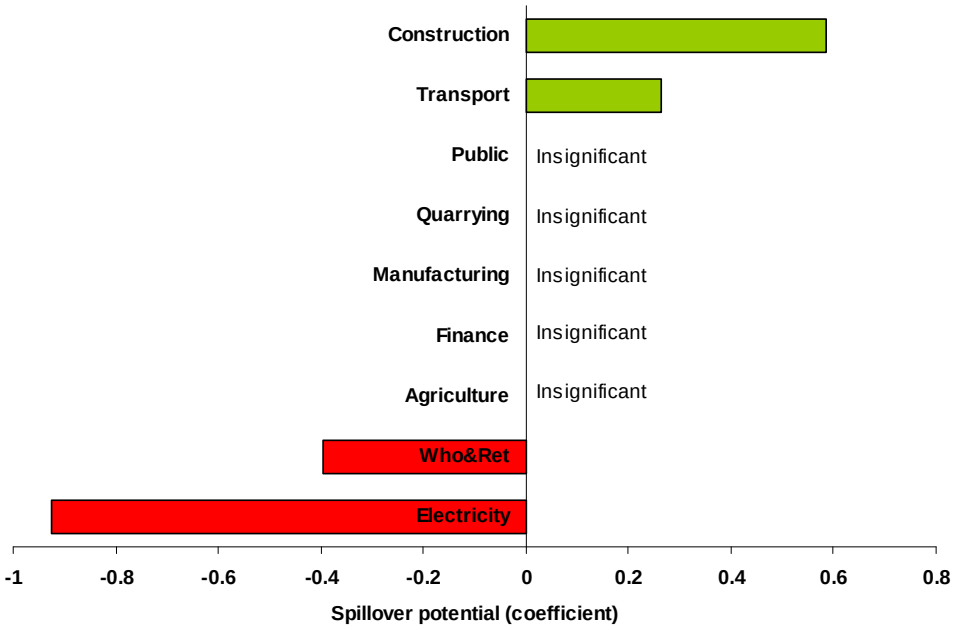
[40] The technical documentation of the model and detail results can be found in Appendix C.

productivity advantage non-existing in exactly these sectors. When the FDI-intensity is very low, we cannot rely on statistical modelling, and when there is no productivity advantage, we cannot expect to measure any spillovers.

But what do negative spillovers mean? Can it make any economic sense? We are not the first to estimate negative spillovers, and building on the findings of others, our answer would be: yes and no. Of course, the presence of foreign firms does not enforce inferior production technologies in local firms, but there still is a case for some negative effects. One explanation would be that multinationals may attract the highest skilled labour as they might be able to pay higher salaries and offer better career possibilities. In this way, the subsidiaries drain the local firms for productive inputs. Moreover, the loss of market shares in local firms could force inefficient use of production factors, especially in the short run. On the other hand, there are statistical reasons why the results may not be very robust. In these regions, we do not find any significant FDI implying that the variable driving the spillover results does not have sufficient variation to allow us to make solid inference. Indeed, this would also be the reason for the lack of statistical significance in the other sectors.

To give an insight into the potential statistical problems of measuring spillovers in regions without any considerable FDI inflows, we present some of the coefficient estimates from the econometric models, c.f. Figure 38. In most sectors, the quantified impacts are simply very close to zero, but in a sector like electricity where the number of firms (observations) is low, other factors seem to dominate the picture and drive the econometric estimate down to an unreasonably low level.

Figure 38: Size of average within-industry spillover coefficient across sectors, remote regions

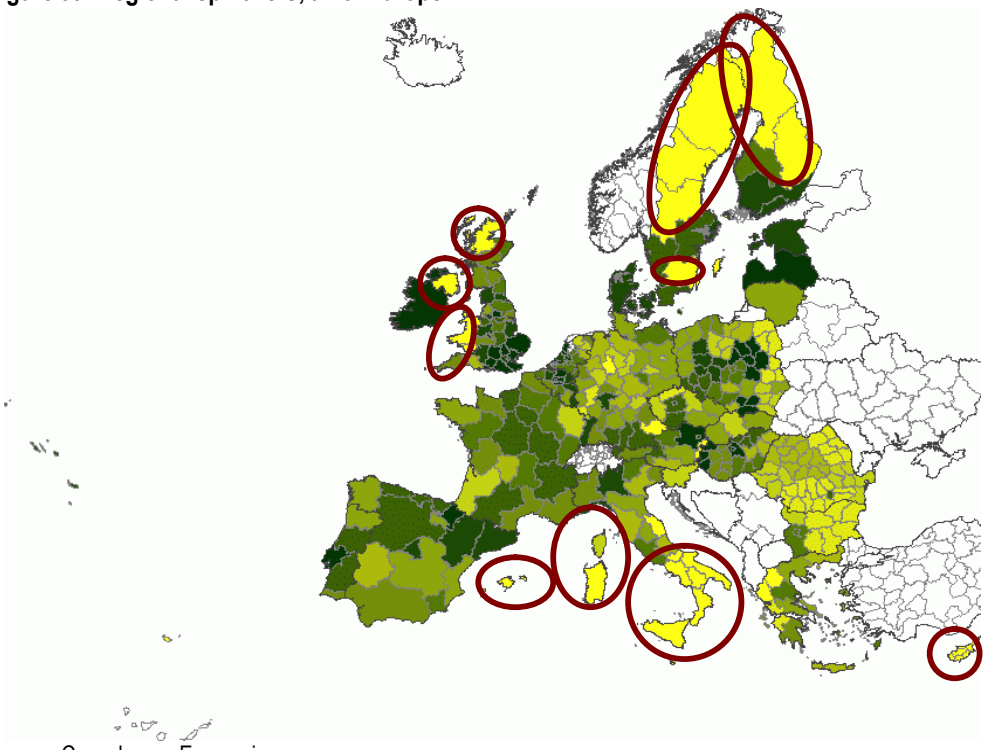


Source: Copenhagen Economics
Note: The figure displays the spillover coefficients for each sector: first, as it has been estimated across all European firms; second, as it has been deduced for this group of regions.

We also try to provide a picture of the lack of spillovers in the remote regions. We have applied the econometric models from all industries throughout all European regions and drawn a map of the total productivity contribution from spillovers, c.f. Figure 39. Darker green colours represent high positive spillovers, whereas yellow colours signify no or even negative

spillovers. And the regions with the lowest spillovers are exactly the remote regions. Conversely, spillovers are higher even in the most developed regions with much less potential to learn.

Figure 39: Regional spillovers, all of Europe



Source: Copenhagen Economics

Note: The figure shows the predicted size of all spillovers in each region. Darker green represents higher spillover impacts. The impacts have been calculated by weighting the products of spillover coefficient and sectoral FDI together to an aggregate regional spillover impact. The encircled regions are fall into the group of remote regions.

What the empirical models cannot determine is whether the rather unfortunate spillover results are due to the attraction of the "wrong" kind of investments, to the lack of spillover potential like e.g. cultural gaps, or simply to the general absence of high FDI inflows into certain frontrunner industries.

6.3. Impact from FDI on labour markets in remote regions

Foreign direct investments have a broad range of impacts on the regional economy, and most of these have not been studied in detail yet. An interesting area is the direct and indirect effects on labour markets. We focus entirely on the employment situation, but acknowledge that skill and wage levels of employees are also important aspects which we do not directly address.

Our methodology consists of three steps starting at a very concrete level with the labour demand of firms having foreign owners and ending at the overall regional level where all inter-industrial linkages have been taken into account.

Mergers & Acquisitions model

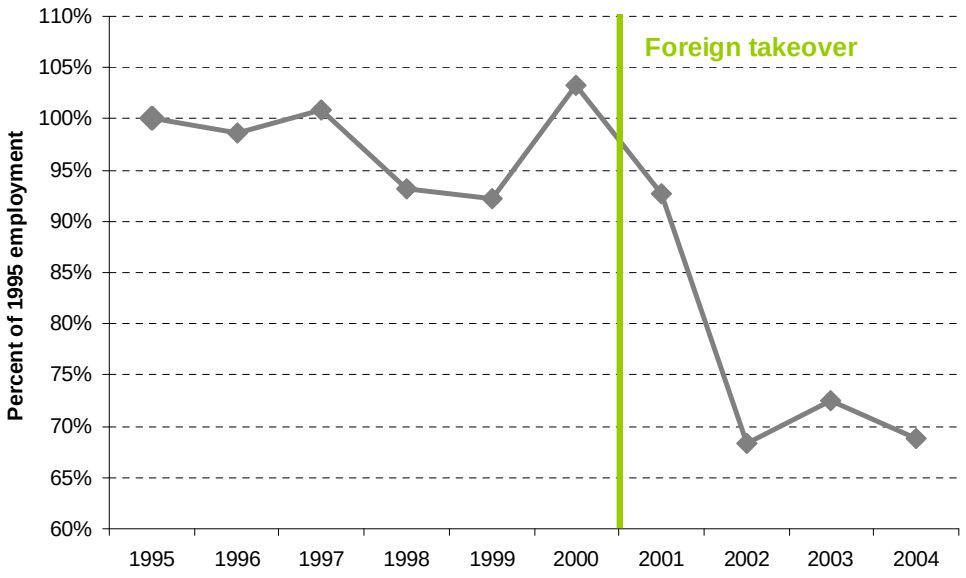
In the first step, we examine the effects when foreign investors acquire an already existing local firm. From a theoretical point of view, it is not clear whether the direct impact should be positive or negative. For instance, it could be argued that foreigners provide more and better capital to the local subsidiary which eventually influences firm level employment positively. At the same time, the possibility exists that foreigners are quick to lay-off redundant workers to improve profitability which would impact employment negatively.

To analyse these aspects, we have set up an econometric model that incorporates the idea of immediate restructuring effects after a foreign takeover.[41] We should mention that the general and most robust result is that foreign takeovers have a short-run negative impact on labour demand. We find the same conclusions if we look exclusively on firms belonging to the remote regions. The econometric estimate lying behind this conclusion tells us that labour demand is reduced by approximately 2 % after a foreign takeover.

But of course, this general picture does not reveal that each firm has its own history where some have benefited and others have lost in terms of employment. We have tried to account for such diversities in the empirical modelling, and we do find evidence of large diversities between the effects of foreign takeovers among different types of firms. We refer the interested reader to Appendix C for more details on classifying firms and estimating separate models.

Despite the diversities among firms, the majority of firms have experienced some kind of down-sizing after a foreign takeover as can be seen by Figure 40, a case in point from northern Finland. The reduction in employment clearly falls immediately after the takeover in the beginning of 2001. The restructuring seems to have brought the firm to a new equilibrium level. We have also calculated the changes in labour productivity (not shown), and when we put the pieces together the restructuring process seems to have paid off.

Figure 40: Development in firm employment before and after takeover



Source: Copenhagen Economics

Note: The figure shows the development in employment in a typical firm being acquired by foreign investors. The graph is based on actual data, but the firm's identity has been covered by indexing the development to the 1995 employment figure.

Generally, takeovers and down-sizing are linked together, but from an overall employment perspective it is less clear whether more in numbers, but less competitive and secure workplaces are preferable to fewer and more secure in the long run.

Labour effects within industry

In the second step of our labour demand analyses, we turn to the effects on the local competitors. Our empirical models have revealed that the resulting increased competitive

[41] Details of the model and detailed results can be found in Appendix C.

pressures from foreign subsidiaries tend to put downward pressure on the labour demand of local competitors. Or, put in a different wording, they are forced to be more attentive towards use of production inputs.[42]

Similar to the models of productivity spillovers, we cannot identify such effects in the remote regions, c.f. Table 6.5. Across sectors, we simply do not find any significant effects apart from three services sectors where the empirical models suggest a positive impact. From an economic point of view such positive effects should only arise if significant productivity spillovers have spurred the competitiveness of local firms. They could potentially sell more at lower prices, and more importantly, they could increase exports to the global market. But we failed to find any positive productivity spillovers. Consequently, the positive coefficients are rather doubtful. Indeed, the actual coefficient estimates are not very large and may simply be a product of pooling together quite diverse regions from the south of Italy over the west of England to the northern regions in the Nordic countries. There might also be other statistical problems when we focus on the remote regions, e.g. the somewhat low number of observations.

Table 6.5: Effects on competitors' (within industry) labour demand

	Agriculture	Quarrying	Manufacturing	Electricity	Construction	Who&Ret	Transport	Finance	Public
Effect from FDI on competitors labour demand	ins-	-	ins+	ins-	Ins+	+	+	+	ins-

Source: Copenhagen Economics

Note: The table represents the sign and significance of estimated coefficients. + (green) means positive and significant; ins+ (light green) stands for positive and insignificant; ins- (light red) for negative and insignificant, and – (red) for negative and significant.

In this light, we find it more adequate to rely on the model results for all European firms, i.e. the negative intra-industrial impact. When the remote regions face increased FDI inflows, we would expect that local firms reply by being more focussed on redundant employees.

Regional labour demand effects

As far as both the productivity spillovers and the labour market impacts have been near to non-existent, we cannot expect to achieve any sizeable effects on the entire regional economy. The third step of our methodology is to assess the overall labour market impacts. Again, we do this by econometric modelling.[43]

These results suggest that firm level labour demand increases as a respond to the positive spillover effects from foreign firms. We actually do find similar results for the remote regions, but they are statistically less robust and in some specifications become untrustworthy high coefficient estimates – especially when we take the lack of productivity spillovers into consideration. Therefore, our interpretation of the results is that the long-run aggregate employment effect of FDI in remote regions is slightly positive.

[42] Appendix C provides the technical details.

[43] The interested reader is refered to Appendix C.

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