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Written by

RAMBOLL

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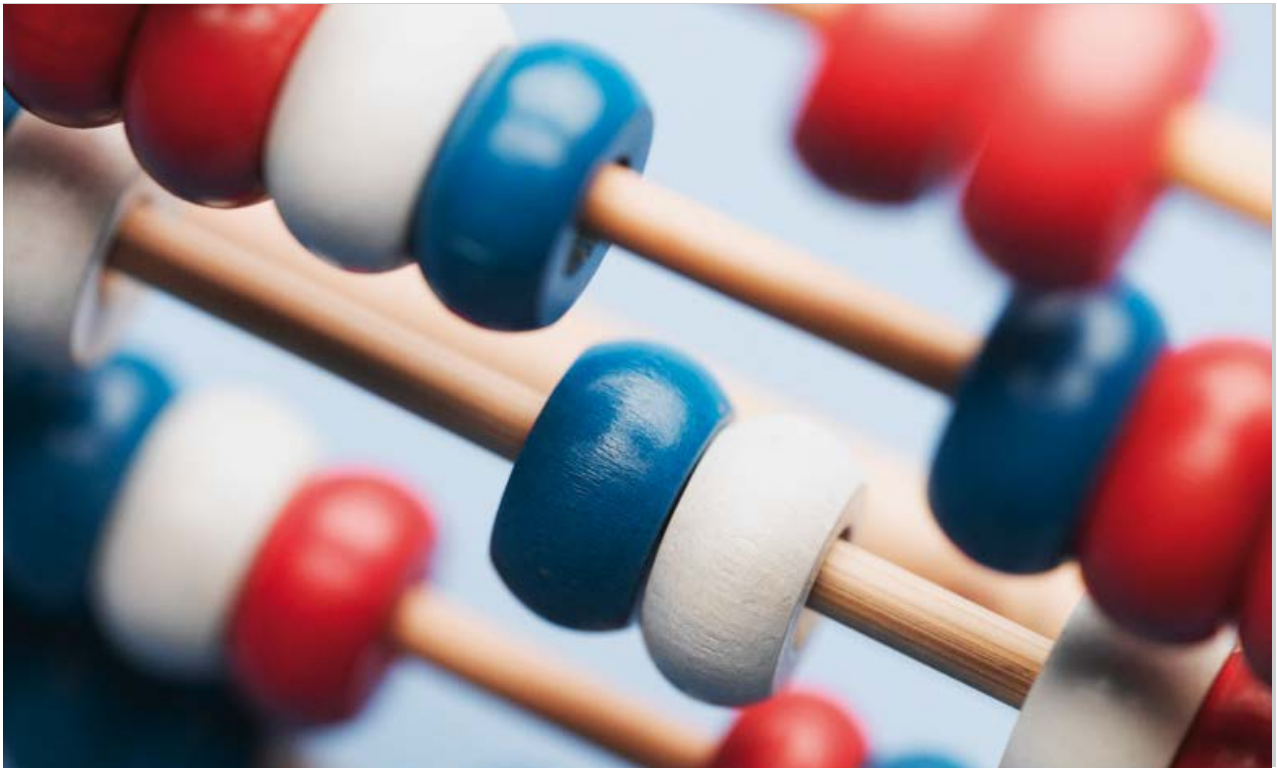

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APPENDICES

Appendix 1
List of Interviews conducted

Appendix 2
Overview of Projects

Appendix 3
Results of survey to beneficiaries

LIST OF ACRONYMS

ABSL	Association of Business Service Leaders in Poland
ACEA	Association des Constructeurs Européens d'Automobiles (European Automobile Manufacturers Association)
AG	Aktiengesellschaft
AICEP	Portuguese Business Development Agency
API	Active Pharmaceutical Ingredient
ASPAPEL	Association of Spanish Pulp, Paper and Board Makers
BPO	Business Process Outsourcing
CEDRU	Centre for Studies and Urban and Regional Development
CEE	Central and Eastern Europe
CELPA	Portuguese Paper Industry Association
CEMBUREAU	European Cement Association
DJEI	Department of Jobs, Enterprise & Innovation
EC treaty	Treaty establishing the European Community
EEG	Germany's Renewable Energy Sources Act
EPIA	European Photovoltaic Industry Association
ERDF	European Fund for Regional Development
ESF	European Social Fund
Etc.	et cetera
EU	European Union
EUR	Euro
FDA	US Food and Drug Administration
FDI	Foreign Direct Investment
GA	Granting Authority
GDP	Gross Domestic Product
GGE	Gross Grant Equivalent
GVA	gross value added
HITA	Hungarian Investment and Trade Agency
HUF	Hungarian forint
IBEC	Irish Business Employers' Confederation
ICT	Information and communications technology
IDA	Irish Investment and Development Agency
IPHA	Pharma Ireland
IT	Information technology
ITD Hungary	Hungarian Investment and Trade Development Agency
LEG	The State Development Corporation of Thuringia
MSF	Multi-sectoral framework on regional aid for large investment projects
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne (Statistical classification of economic activities in the European Community)
NGE	Net Grant Equivalent
OECD	Organisation for Economic Co-operation and Development
PAIZ	Polish Information and Foreign Investment Agency
PLN	Polish złoty
PV	Photovoltaic
R&D	Research and Development
RAG	Guidelines on National Regional Aid (Regional Aid Guidelines)
SAMO	State Aid Monitoring Office, Ministry of National Development)
SSC	Shared Service Centres
TFEU	The Treaty for the Functioning of the European Union
US	United States of America
USD	United States Dollar
WTO	World Trade Organization

EXECUTIVE SUMMARY

The European Commission's Regional Aid Guidelines[1] define the criteria applied by the European Commission when examining the compatibility of regional aid granted by Member State public authorities within the European internal market.

In order to prepare for a review of the RAG 2007-2013, DG Competition of the European Commission commissioned Ramboll Management Consulting to evaluate current implementation and impact.

Objectives of the study

This ex-post evaluation has the following core objectives:

1. Identify the determinants of investment or location decisions of the firm in question, including the incentive effect of regional aid in these decisions;
2. Assess the consequences of the investments in terms of regional and employment benefits and externalities;
3. Analyse the distortive effects of aid for competitors and/or other regions.

The Regional Aid Guidelines

Regional Aid needs to be seen within the broader spectrum of state support for industry that may include initiatives ranging from lower corporation tax rates to relaxed planning regulations.

Regional Aid Guidelines (RAG) support the implementation of Article 107 (3)(a) and (c) TFEU. They define the criteria applied by the European Commission when examining the compatibility of regional aid granted by Member State public authorities with the European internal market. Generally, only national regional aid that aims to promote the economic development of certain disadvantaged areas within the European Union is considered compatible. By setting maximum aid intensities (ceilings), the RAG is also designed to prevent Member States from entering into competition with each other for potential investors and to avoid the development of market distortion.

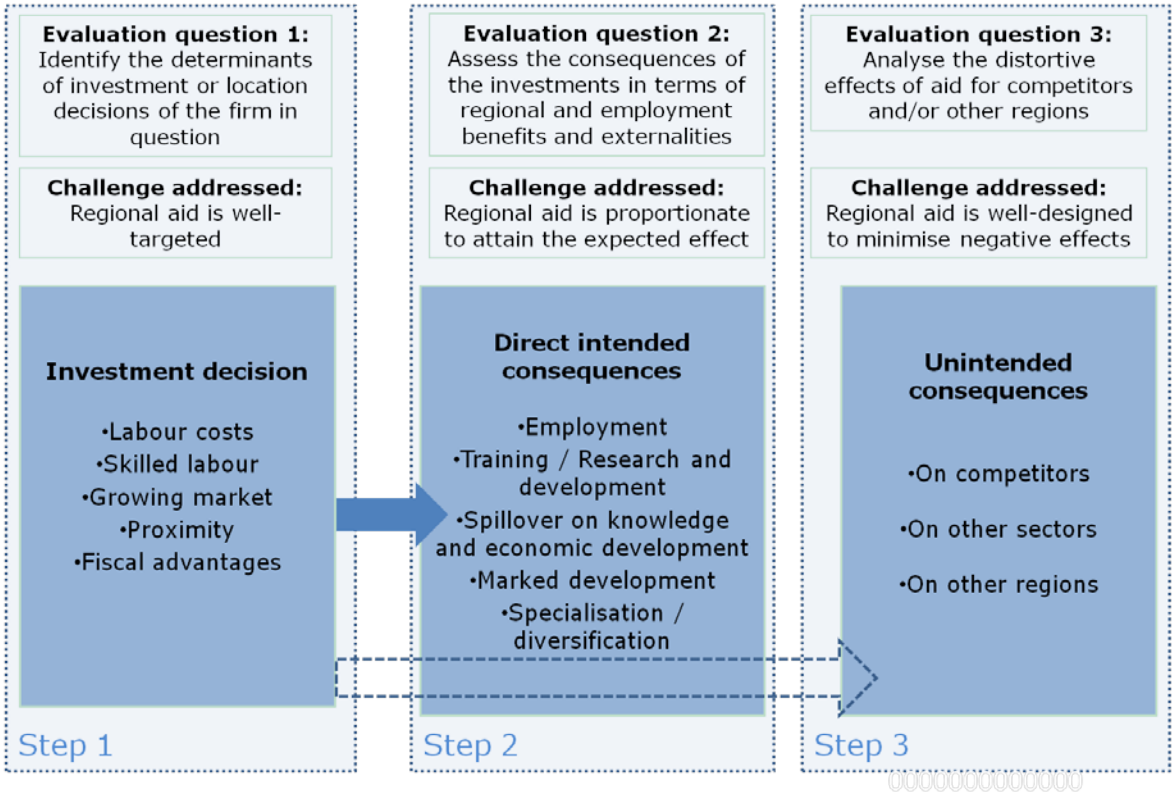
[1] Guidelines on national regional aid for 2007-2013 (2006/C 54/08)

Study Framework

The Commission's approach to in-depth assessment[2]provides an analytical framework that has informed the structuring of the analysis and reporting. On this basis one can assert that regional aid needs to be:

1) well-targeted so as to provide incentive effects for investors and attract investment in less developed regions;
2) proportionate to the challenge faced by ensuring value for money in terms of employment and other benefits to the region and to account for potential externalities;
3) well-designed so as to minimise negative effects on competitors, other sectors and other Member States and to ensure that positive impacts outweigh negative impacts.

The report sets out to verify if these requirements have been fulfilled, using the following analytical framework.



Methodology

The evaluation is based upon a case study design, consisting of six case studies covering different economic sectors in different Member States or groupings of states. A total of 28 investment projects were investigated in seven Member States, analysing data across sectors, Member States, Granting authorities' practices, types of investment and so forth. More than 70 interviews were conducted with industry and regional experts, aid beneficiaries and their competitors as well as with external consultants. Data collection started in August 2011 and was completed in July 2012. The interviews were augmented by desk research.

[2] Communication from the Commission concerning the criteria for an in-depth assessment of regional aid to large investment projects (2009/C 223/02))

Overview of Case Studies

The industry case studies covered the following:

- Pharmaceutical industry, Ireland
- Solar industry, Germany
- Car industry, Slovakia/Hungary
- Internal business services, Poland
- Cement industry, Hungary
- Paper industry, Spain/Portugal

The Aid Process

The aid award decision process

Granting authorities offer a variety of aid schemes that differ in terms of the type of eligible expenditure (i.e. capital expenditure vs. labour costs) and the types of instruments that are used (i.e. direct grant, tax relief, soft loan etc.).

Regional aid schemes are designed in accordance with national regional development strategies. Furthermore, granting authorities differ in terms of the tier of government that manages the aid process. In the case of Germany and Spain a regional granting authority awarded the aid. The study found that regions that were competing to attract investment within the same country could find themselves in an upward spiral that increased aid levels.

The ex-ante **project evaluation processes** and criteria applied differed significantly from one granting authority to the other.

In most countries, projects are assessed against a set of **qualitative criteria** that reflect both the policy priorities of the public authorities (in terms of regions, sectors and types of activity, for instance) and the potential benefits of the projects (in terms of the number and the quality of jobs created, the complexity of the processes to be performed or the technologies to be used, the level of involvement in cooperation with local universities, the level of Research and Development (R&D) expenditure etc.).

Within this study there was **no evidence** of cases where the incentive effects of aid on the investment or location decisions were systematically assessed as part of the ex-ante process carried out by the granting authorities. The obligation for the investors to prove that regional aid was necessary for their investments appeared largely to be dealt with as a matter of formality.

Practices to determine the **amount of aid allocated** to investments also significantly differed from one granting authority to another.

The most structured approach was found in Poland, where different evaluation criteria were applied within a broader **multi criteria analysis** framework. In Ireland, the granting authority used a cost-benefit model to assist in project evaluation and the setting of the aid amount (the benefits of the investment should always exceed its costs, including the aid amount). The Slovak granting authority to evaluate investment projects also undertook financial and socio-economic analysis. The regional granting authorities in Germany, on the other hand, did not use any economic cost-benefit modelling process, deeming it to be an inefficient tool that creates more administrative burden than it is worth and helping little in making informed decisions.

With the exception of the Polish granting authority, all other granting authorities “negotiated” the level of financial incentives with the potential beneficiaries, suggesting that the outcome of such negotiation (subject to the ceiling set by the RAG) was at least in part dependant on the relative bargaining power of the two parties involved.

There was no linear causality linking aid intensity to the principle investment decision. Such ***“reverse causality”*** should be taken into account when assessing the impact of regional aid on investment or location decisions. As will be seen, the case studies that had the lowest aid intensities are also those that appeared to show the lowest overall incentive effect.

The **terms of the aid agreements** between granting authorities and beneficiaries also differed from one case study to another.

In Ireland, Poland and Slovakia, the payment of the aid was conditional upon the achievement of objectives in terms of the number of jobs created. In other case studies, one can find examples of projects for which aid was paid in full even though the objectives were not fully achieved. Examples include investment projects in the pulp and paper industry in Spain and Portugal and in the solar industry in Germany.

The investment decision process

In the case of all the investment projects analysed, the Board of the aided firm was involved in the final investment decision and the decision process was most frequently **handled at the highest level within the particular organisation**. This in part helps to explain the difficulty in accessing information regarding investment and location decisions.

In the **investment decisions**, one can distinguish top-down and bottom-up processes. In the top-down process, the investment project is initiated by the parent company. By comparison bottom-up processes tended to originate with decentralised business units that proposed an investment project to their parent company.

Location decisions are characterised by the multiplicity of selection criteria considered by decision-makers. As is the case with the investment decision, the location decision usually involves the board of the investing company. However, it also appears that the location decision is more decentralised than the decision to invest itself. External consultants are usually involved in the screening of possible locations.

In order to ensure efficiency of the investment, investors assessed hard location factors in monetary terms, including costs of land, labour, commodities and transport. However, in none of the analysed projects did it specifically appear to be the case that return on investment calculations were used to compare alternative locations (also accounting for aid). More usually, a multi criteria analysis was applied at the location decision stage.

Determinants of Investment Decisions

The main determinants of investment decisions other than regional aid can be divided into three broad categories: efficiency seeking; market seeking and factors of production.

The most commonly shared investment objective is ***efficiency seeking***. In some projects, the need to increase efficiency through cost reduction, economies of scale and/or higher productivity was the main investment driver, being evident to a greater or lesser extent in all projects considered in this study.

The most striking examples of investment projects driven primarily by a desire to see efficiency gains can be found in the internal business services case study in Poland. Another example is the pulp and paper industry in Spain, where investment projects were also driven by the need to increase productivity.

A second category of investment determinants can be grouped under the generic concept of ***market seeking***. In such case the investment decision is determined by the need to meet increasing or changing patterns of demand.

The cement industry in Hungary provides examples of investment projects that are driven by *growing demand* and another example is the solar industry in Germany, where the market growth, heavily supported by government policies in favour of renewable energies, was an important investment driver.

Better *access and proximity to growing markets* is another important factor driving investment decisions: case studies in both Germany and Hungary revealed that investment and location decisions were highly interrelated in this respect.

Market seeking is not only related to growing demand, but also *changing demand* as well as *technological innovation* (see below). Both induce the development of new products, which in turn requires investment in new production processes and new or additional production lines. This has been observed in the case of the car industry in Slovakia and Hungary. The pharmaceutical industry case in Ireland provides similar examples.

A last category concerns those investments aimed at **increasing or improving factors of production**, i.e. investments driven by *resource seeking*. In most case studies, the availability of raw materials (e.g. cement industry in Hungary) and skilled human resources (e.g. internal business services in Poland) were important determinants of the choice of location. In the case study on the pulp and paper industry in Spain and Portugal, the availability of new production technologies provided companies with strong incentives to modernise their production machinery.

Incentive effect of the aid for the investment decision

Decisions to invest are highly strategic for the aided firms and the study findings suggest that regional aid had at most a marginal impact on the initial decision for a company to initiate an investment programme. Aid was never reported to be irrelevant but no investor consulted during this study considered such aid to have been a decisive factor in their decision making process.

In a limited number of projects interviewees stated that the aid provided an incentive in terms of the size of the project, including three projects from the pulp and paper industry in Spain and Portugal, for which the need to modernise the production tools, increase productivity and adapt to increasing competition were the main investment drivers. In addition, for these case studies the availability of aid facilitated access to external financing.

Finally, it is interesting to note that no evidence of lock-in effects of state aid on the investments could be observed.

Determinants of Location Decisions

One of the most frequently mentioned determinants of location choice is the fact that a company had **pre-existing production** at the selected location. Indeed, the sample of projects includes only eleven "greenfield" investments, seven of which related to the setting up of internal business service centres in Poland. All other projects involved the extension of capacities, diversification of output or changes in the production process of existing facilities.

The cases of the pharmaceutical industry in Ireland, the solar industry in Germany and the pulp and paper industry in Spain and Portugal exhibit strong **path dependence** on the location of investment.

A location factor almost always mentioned was the **availability and cost of the labour force**. In almost all cases, the availability of skilled labour was a decisive location factor. The type and degree of expertise sought differed, however, from case to case.

Infrastructure including transport and accessibility, energy supply and communication networks seem to be considered assumed prerequisites as they were rarely mentioned as decisive factors in the location decisions.

Proximity to **raw materials** was a decisive location factor in two cases, mainly to reduce the high transportation costs of heavy materials. The cost of commodities was mentioned as a determining location factor in only one investment.

The **availability of land** was an important location determinant in establishing new production plants in the solar industry in Germany (in which follow-on investments were already planned at the time of making the investment decision), the car industry in Slovakia and Hungary, and in some instances in the pharmaceutical industry in Ireland.

Soft location factors including political and economic stability played a role in the location decision, but only when locations considered as alternatives were outside Europe.

Business friendly environments, in terms of taxation or industrial property law, for instance, were also mentioned as determinant location factors in the cases of the pharmaceutical industry in Ireland and the internal business services in Poland.

Finally, support from local authorities in finding the appropriate location was mentioned as an important related factor. The eagerness and proactivity of the local authorities and other partners locally, such as universities, can make a difference in the final decision. This is also described in the following section.

Intra-sectoral agglomeration economies (in the form of the **presence of an industry cluster**) proved to be a significant location factor in the case of the pharmaceutical industry in Ireland, the solar industry in Germany and the paper and pulp industry in Spain and Portugal.

Incentive effect of the aid for the investment decision

The project sample includes projects in which, without regional aid, the investments would have probably been located elsewhere. The car industry in Slovakia and Hungary is one case study where regional aid provided an incentive for the firms to locate their investments in less developed regions within Central and Eastern Europe. The case study of the solar industry in Germany also provides instances where regional aid was a decisive location factor. In both cases, however, it is not easy to identify the counterfactual, which would consist of a situation where no aid would be offered at all.

In the cases of the pharmaceutical industry in Ireland and internal business services in Poland, the beneficiaries acknowledged that regional aid provided no or very limited incentives to locate in less developed regions. Instead, granting authorities consider that the aid is an opportunity to establish contact with investors and support them in finding the appropriate location.

Aid had no impact on the location decisions in the case studies of the pulp and paper industry in Spain and Portugal and of the cement industry in Hungary. A number of case studies point to the aid having had a low incentive effect. The case studies where the incentive effect of the aid appears to be the lowest are also those for which the amounts of aid and aid intensity offered were the lowest (i.e. pharmaceutical industry in Ireland and internal business services in Poland). However, one cannot easily tell whether actual aid intensity being low results in a low incentive effect or the anticipated incentive effect being low causes low aid intensities.

Impact of Regional Aid Funded Investment

Most of the aided investments had an **impact on direct jobs** contributing to the creation of several hundred jobs at each investment site. There were two exceptions: the pharmaceutical industry in Ireland and the pulp and paper industry in Spain.

Systematic evidence of **jobs safeguarded** on the investment sites was not collected, mainly because it was not deemed a relevant indicator by granting authorities or the European Commission. That having been said, the project sample does include several instances of investments at existing sites that have contributed to safeguarding jobs in the respective regions.

Projects including R&D components are those offering the strongest evidence of **improved quality of jobs** with prominent examples found in the solar industry in Germany and in the pharmaceutical industry in Ireland.

Positive effects in terms of **indirect jobs and additional demand** were observed in a majority of cases examined. In all projects, the beneficiaries declared that more than 80% of the employees in direct jobs created lived within a 50 km radius of the site.

The most significant impacts on **R&D activities** in connection with the investment projects were found in the case studies of the pharmaceutical industry in Ireland and the solar industry in Germany, where all aided projects were connected to a regional or inter-regional industrial cluster and included important R&D components. To a lesser extent, some investment in R&D could also be identified in the case of the pulp and paper industry in Spain and Portugal.

Evidence of enhanced **cooperation with local higher education institutions** were found in all cases except the cement industry in Hungary.

The most striking evidence of a **spill-over effect** can be found in the pharmaceutical industry in Ireland and the solar industry in Germany. In Ireland, investments have contributed to sustaining intra-sectoral spill-over effects, in that they contribute to the development of the pharmaceutical industry in the Republic through activities and capabilities that generate and deliver higher value.

Investments in the regions appeared to be **sustainable** in most cases. In many of the projects in the internal business services in Poland and in the pulp and paper industry in Spain and Portugal, follow-on investments were already planned and completed at the time of the study.

No systematic assessment of **value for money** was carried out as a part of this study, but the following points can be made:

Value for money of regional aid is directly linked to the incentive effect of the aid, with **low incentive effect correlating to low value for money** and vice versa.

It is also possible to compare the costs of direct jobs created to the amount of aid received. Here, one can see that the **amount of aid per new job** ranges between from approximately €50,000 in the car industry in Slovakia and Hungary to €200,000 in the solar industry in Germany.

The case studies in Ireland and Poland suggest that value for money is best secured through **carefully set amount of aid** and **tight agreements** that allow the granting authority to ask for the grants to be paid back if the objectives in terms of job creation or investment schedule are not met.

The case study on the cement industry is the only one where the regional aid clearly did not provide value for money as the study did not assess it to have a precise purpose.

Distortive Effects of Regional Aid Funded Investment

There was **very limited evidence** was gathered from the study of potentially negative effects of the aid on competitors. A majority of competitors interviewed as part of the study did not express any such concerns although one must recognise that competitors are also potential beneficiaries of aid.

In addition the study established that the availability of state aid did not drive the initial investment decision for any of the cases considered and that investment was likely to have taken place in its absence. Given this is has been necessary to look at evidence of the **marginal impact of state aid on scale, timing or focus** of the investment programmes.

When aid has little or no incentive effect for the investment or location decision, aid can basically be viewed to be additional revenue for the beneficiaries, which is potentially distortive if it does not compensate for any additional costs. Such distortive effect is potentially more significant in cases where the aid amount or intensity is high.

Here absolute values are important and at an industry case study level, the aid awarded to investors in the cement industry in Hungary as well as the Pulp and Paper industry in Spain and

Portugal provide the **clearest examples** of where the presence of **state aid could have impacted negatively on competitors** by helping to increase capacity during periods of declining demand.

Potential congestion effects could be observed in Poland, where two investment projects saw labour costs rise. Similar impact could be observed in the case of the cement industry, where new plant in one case study increased competition on the local job market, which resulted in an increase in wages in another production plant locally. Yet in both cases any potentially negative impact cannot be attributed to the availability of state aid, as such aid did not materially influence the decision on where the investment would take place.

There was also a very limited sense of impact on other regions. The most direct example of potential impact came from the example of the paper industry where Scandinavian stakeholders stated that they felt **market share or even jobs had been unfairly jeopardized** by state subsidized investment programmes in Spain and Portugal, although the study found **no means to establish a causal link**.

Yet these findings do suggest the need for a more considered assessment by the granting authorities of the true incentive effect of regional aid as well as closer monitoring of industry sector trends as part of the broader RAG process.

Conclusions & Recommendations

The Evaluation has been focussed on using industry case studies to answer the three related questions as to the impact of regional aid and the RAG.

1. Regional aid is not a primary driver for investment, but it can have a material impact on the scale, timing and structure of investments. Regional aid provides incentive effect for the location decisions, although other location factors were of greater importance.

2. Investment programmes receiving state aid generate a range of direct and indirect benefits.

3. There are potentially negative impacts as a result of regional aid supported investments, but no clear causal link could be established between the grant aid element of the investment programme and impacts on market efficiency or competition.

It is not within the remit of the evaluation to make explicit recommendations, however the following three areas are worthy of further thought:

1. Supporting regional aid bodies to undertake robust ex-ante economic assessments and ex-post evaluations of regional aid.

2. Reassessing how and when consideration is given within the aid process to the incentive effect of the aid for the investment and locations decisions as well as the potentially negative impacts on competitors at both industry and regional level.

3. Reassessing maximum aid levels within the RAG to ensure that less well-resourced countries are not excluded from competing for investment opportunities on the grounds of affordability.

1. INTRODUCTION

1.1 The Regional Aid Guidelines 2007-2013 (RAG)

1.1.1 Competition policy and regional aid

State aid policy prohibits any aid granted by a Member State in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods insofar as it affects trade between Member States. This policy is aimed at preserving a level playing field among economic operators as a means to ensure competition and to foster innovation and growth. However, in application of TFEU, derogations to the general prohibition of State aid can apply to aid granted to promote the economic development of areas where the standard of living is abnormally low or where there is serious underemployment, including the outermost regions, in view of the their structural, economic and social situation, and to aid to facilitate the development of certain economic areas where such aid does not adversely affect trading conditions to an extent contrary to the common interest. The European Commission has exclusive competence to declare such aid compatible with the internal market (under certain conditions, and acting unanimously, the Council may also to declare aid compatible with the internal market).

The compatibility criteria to be fulfilled as regards such aid are defined by the European Commission and laid down in different texts:

- Guidelines on national regional aid for 2007-2013 (hereinafter referred to as the "RAG") , which lay down the provisions on the basis of which notified state aid granted in order to promote the economic development of certain disadvantaged areas within the European Union can be considered compatible with the internal market;
- Communication concerning the criteria for an in-depth assessment of regional aid to large investment projects (hereinafter referred to as the 'in-depth assessment Communication' or 'IDAC');
- Relevant provisions of Commission Regulation (EC) No 800/2008 of 6 August 2008 declaring certain categories of aid compatible with the common market in application of Articles 87 and 88 of the Treaty (General block exemption Regulation – GBER), which lay down, *inter alia*, the conditions under which regional State aid is considered to be compatible with the internal market without requiring prior notification to the Commission.

Regional aid aims at promoting the development of less-favoured regions by supporting initial investment and employment linked to initial investment and newly created small enterprises or, in exceptional cases, by providing operating aid.

1.1.2 Eligibility rules for regional aid

Eligible areas

Eligible areas are identified in the regional aid maps for each Member State, as published on the website of DG Competition. Two categories of eligible regions can be distinguished:

- Article 107(3)(a) regions: These are regions where the standard of living is abnormally low or where there is serious underemployment (NUTS 2 regions with a GDP/capita lower than 75 % of the EU average).
- Article 87(3)(c) regions: These are problem areas defined on the basis of (national) indicators proposed by the Member States, subject to a maximum population coverage and some minimal conditions to prevent abuse.

Eligible investments

The Regional Aid Guidelines (RAG) cover investment aid, aid to newly created enterprises and operating aid to establishments in regions eligible for regional aid. They do not apply to the primary production of agricultural products listed in Annex I of the Treaty. They generally apply to the processing and marketing of agricultural products. However, they do not apply to the fisheries sector or to the steel and coal industry or synthetic fibres industry. Special rules apply to transport and shipbuilding.

Regional investment aid can only be granted for initial investment projects (except for SMEs and in case of a takeover of an establishment that would otherwise have closed). Under the RAG 2007-2013, investment projects qualify as such if they relate to:

- the setting-up of a new establishment;
- the extension of an existing establishment;
- diversification of the output of an establishment into new, additional products; or
- a fundamental change in the overall production process of an existing establishment.

In addition, in order to be eligible for aid under the RAG, the projects have to comply with the following conditions:

- Regional aid produces a real incentive effect to undertake investments which would not otherwise be made in the assisted areas;
- Maintenance of the investment in the region for a minimum period of at least 5 years (3 years for SMEs) after its completion;
- Financial contribution of the beneficiary of at least 25% of the eligible costs.

Eligible types of aid

A wide range of aid instruments are eligible under the RAG. Aid may (by way of example) “take the form of grants, low-interest loans or interest rebates, state guarantees, the purchase of a share-holding or an alternative provision of capital on favourable terms, exemptions or reductions in taxes, social security or other compulsory charges, or the supply of land, goods or services at favourable prices”[3]. Member States may also set up compensation mechanisms for exchange rate fluctuations.

[3] RAG 2007-2013, 37.

1.1.3 Aid ceilings

Regional ceilings

Under the RAG 2007-2013, the maximum aid intensities (ceilings) for large companies in regions falling within the scope of Article 87(3)(a) must not exceed:

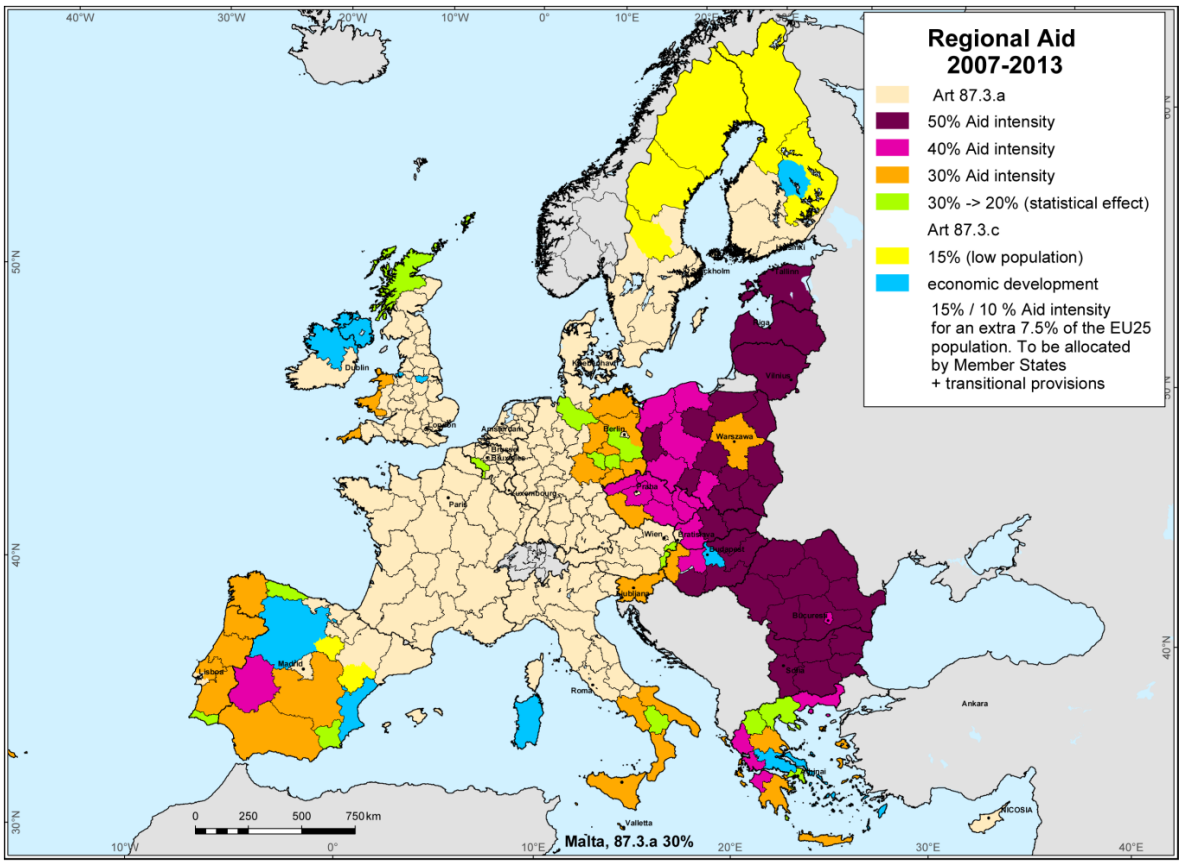
- 30 % for regions with a per capita GDP less than 75 % of the EU-25 average;
- 30 % for the outermost regions[4];
- 30 % for statistical effect regions until 1 January 2011;
- 40 % for regions with a per capita GDP less than 60 % of the EU-25 average;
- 50 % for regions with a per capita GDP less than 45 % of the EU-25 average;

The aid ceilings for large companies in regions falling within the scope of Article 87(3)(c) must not exceed:

- 15 % as a rule;
- 20 % or 30 % for statistical effect regions as of 1 January 2011;
- 10 % for regions with a GDP per capita that is more than 100 % of the EU-25 average and an unemployment rate lower than the EU-25 average measured at NUTS 3 level;

The following map shows the regions eligible for regional aid and the GGE ceilings for regional aid for the period 2007-2013.

Figure 1: Regional Aid Map 2007-2013[5]



[4] These regions are eligible for a further bonus of 20 % if their GDP per capita is below 75 % of the EU-25 average and a bonus of 10 % in other cases.

[5] European Commission, DG Competition

Specific ceilings for large investment projects

For large investment projects (LIP), i.e. investments with eligible expenditures above €50 million, the regional aid ceilings are adjusted using a "scaling-down" mechanism.[6] This means that the maximum permitted levels of aid for large investment projects are lower than for smaller investment projects. The following table shows the adjusted aid ceilings.

Table 1: Adjustment of regional aid ceilings for large investment projects[7]

Eligible expenditure	Adjusted aid ceiling
< €50 million	100% of regional aid ceiling
= €50 million to €100 million	50% of regional aid ceiling
> €100 million	34% of the regional aid ceiling

The following example illustrates the calculation of the adjustment. For a project with nominal eligible expenditures[8] of €180 million at a location with a regional aid ceiling of 40%, the maximum allowable aid is calculated as follows:

€50 million * 100% * 40% GGE + €50 million * 50% * 40% GGE + €80 million * 34% * 40% GGE = €40.88 million

The calculation above is equal to a maximum allowable aid intensity of 22.7% GGE. Member States may obviously decide to award aid that is lower than the maximum allowable aid intensities.

1.1.4 Notification of state aid

As a general rule, regional aid should be granted under a multi-sectoral aid scheme, which forms an integral part of a regional development strategy with clearly defined objectives (as stated under the GBER)[9]. In this case, the strategy has been approved by the Commission, and there is no need of further formal notification.

Nevertheless, Member States have to notify individually any aid for investment projects if the aid proposed is more than the maximum allowable amount of aid that an investment with eligible expenditure of € 100 million can receive under the applicable rules[10] (i.e. the notification threshold established by §67 of the Commission's RAG)[11].

For these notified cases ("N cases"), the Commission may conduct a formal investigation procedure (in-depth assessment) pursuant to Article 108§2 of the Treaty to verify in particular the aid intensities, the compatibility with the general criteria of the RAG and whether the notified investment represents a major increase of production capacities, while at the same time addressing an underperforming or even declining market, or benefits firms with high market shares[12].

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[6] RAG 2007-2013, 67

[7] RAG 2007-2013

[8] In case not indicated otherwise, this study solely refers to nominal values. Eligible expenditures may vary from total investment sum of an investment project.

[9] European Commission (2008). "Commission Regulation (EC) No 800/2008 declaring certain categories of aid compatible with the common market in application of Articles 87 "and 88 of the Treaty (General block exemption Regulation)".

[10] European Commission. Guidelines on national regional aid for 2007-2013 (§64). Published on the Official Journal C 054 , 04/03/2006 P. 0013 – 0044. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC0304(02):EN:HTML

[11] Ibidem. §67.

[12] Ibidem. §101.

It may be worth noting that in the "Commission Working Document. Guidance on the in-depth assessment of regional aid to large investment projects. §1.3." it is stated that the Commission "verifies" each case, while in the article 108(3) of the Treaty there is no direct reference to any praxis of verification, but just to what to do in case the verification states any unaligned aid practice. The working paper is available at: http://ec.europa.eu/competition/state_aid/reform/consultation_large_investment_projects.pdf

Furthermore, the Guidelines on national regional aid for 2007-2013 state that, where, exceptionally, it is envisaged to grant individual *ad hoc* aid to a single firm, or aid confined to one area of activity, it is the responsibility of the Member State to demonstrate that the project contributes towards a coherent regional development strategy and that, having regard to the nature and size of the project, it will not result in unacceptable distortions of competition[13].

1.2 Objectives of the study and evaluation questions

The objective of this study is to evaluate the aid control instruments applicable for regional investment aid, as contained in the RAG, the provisions of the GBER on regional investment aid and in the Communication on the in-depth assessment of large investment projects. The result of this evaluation should contribute to on-going reflections in the context of the revision of the RAG for the period 2014-2020.

The following evaluation questions are addressed in the study:

1) Identify the determinants of investment or location decisions of the firm in question

a) What were the main factors taken into account by the firm in its decision to invest in the project and to select the location of the investment?
b) What was the relative weight of these factors and in particular of the regional aid in this regard? Was the aid pivotal?
c) What would the firm have done without aid?
d) Which were the alternative locations if any? Advantages and disadvantages of those locations?

2) Assess the consequences of the investments in terms of regional and employment benefits and externalities

a) What were the main regional benefits and externalities related to the regional investment aid? Can these be quantified?
   i) Did the regional investment aid create direct and indirect jobs and in which proportion? (direct/indirect jobs). To what extent can this job creation be considered as structural?
   ii) Did regional investment aid trigger additional training and/or R&D?
   iii) What were the main types of spill-over in terms of knowledge and economic activity (clusters)?
   iv) Is there any indication on the long term regards the maintenance of the investment in the regions once the mandatory period is over (5 years or less according to the type of beneficiary)?
b) Did the aid provide “value for money”, i.e. did the regional benefits exceed the aid amount?
c) What were the main drivers for the above positive effects? Were they project-specific or region specific (e.g. specialisation via clusters vs. diversification of the economy)?

3) Analyse the distortive effects of aid for competitors and/or other regions

a) What were the main effects for competitors?
b) What are the effects for other regions?

[13] European Commission. Guidelines on national regional aid for 2007-2013. Published on the Official Journal C 054 , 04/03/2006 P. 0013 – 0044. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC0304(02):EN:HTML

1.3 Methodology

The evaluation study builds on a case study design. The proposed approach is an embedded multiple case design, with multiple units of analysis. It is described below, after the theoretical framework of the study has been described

1.3.1 Study framework

The three sets of questions defined by the Commission reflect the underlying theory of change (or theory of harm) of the RAG. This analytical framework is further described in the Communication from the Commission concerning the criteria for an in-depth assessment of regional aid to large investment projects[14].

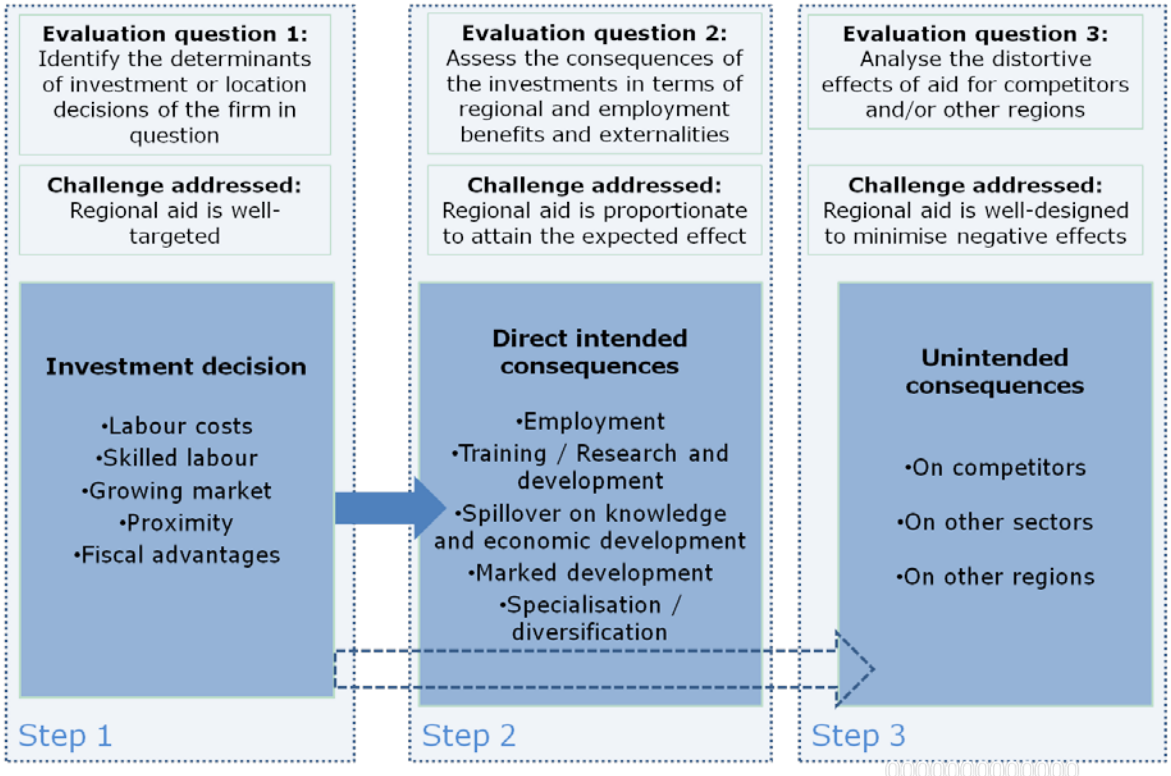
Although it has not been the intention of the study to systematically apply the Commission's approach to in-depth assessment[15], the latter still provides with a useful analytical framework that helped structuring the analysis and reporting.

Basically, the regional aid needs to comply with the following requirements:

1) well-targeted in order to provide incentive effects for investors and achieve effectively the objective of attracting investments in less developed regions;
2) proportionate to the challenge faced, i.e. providing value for money in terms of regional and employment benefits and externalities;
3) well-designed, so as to minimise negative effects on competitors, other sectors and other Member States, and ensure that positive impacts outweigh negative impacts.

Thus, the report sets out to verify if these requirements have been fulfilled, using the following analytical framework.

Figure 2: Analytical framework for the study



[14] 2009/C 223/02

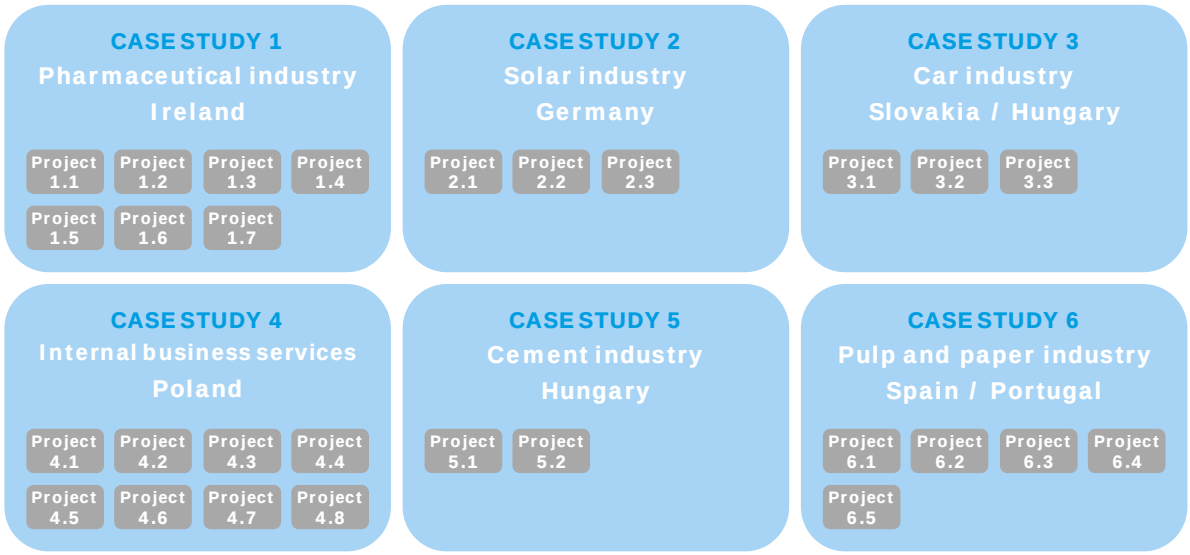
[15] Communication from the Commission concerning the criteria for an in-depth assessment of regional aid to large investment projects (2009/C 223/02)

1.3.2 Case study design

The Commission selected a sample of 28 investment projects carried out between 2002 and 2010, and that received state aid under the provision of the RAG or GBER. The selected projects cover six industries and seven Member States.

The projects, which by themselves constitute the first analytical unit, were grouped into six industry case studies, which constitute the second analytical unit, as illustrated in the figure below.

Figure 3: Case study design, analytical units



As can be seen the sample provides a good diversity of eligible areas, sectors and procedures, but is not aimed to be representative of the entire population of investment projects that were awarded regional aid during the same period. Instead, the sample of projects was designed in a pragmatic way, in order to enable grouping, and make impacts observable and results comparable, so that overall conclusions could be derived across case studies, at the level of the RAG.

The following table provides an overview of the cases and the grouping into case studies.

Table 2: Cases in scope of the evaluation

Case study	Beneficiary	Region (NUTS 3)	Procedure
Pharmaceutical industry, Ireland	Servier (Supram)	South-East	MF 44/2006
	Amgen Technology	South-West	MF 54/2006
	Pfizer Ireland Pharma	South-West	MF 59/2007
	Eli Lilly	South-West	MF 62/2007
	SmithKline Beecham	South-West	MF 82/2007
	Teva Pharma Industries (Ivax International)	South-East	MF 2/2008
	GlaxoSmithKline Dungarvan	South-East	MF 42/2008
Solar industry, Germany	Ersol Solar Energy	Erfurt, Kreisfreie Stadt	N 539/2008
	Masdar PV	Erfurt, Kreisfreie Stadt	N 545/2008
	Wacker Chemie	Meißen	N 221/2009
Car industry, Slovakia / Hungary	Getrag Ford Transmissions Slovakia	Košický kraj (Slovakia)	N 158/2005
	Mercedes-Benz Manufacturing Hungary	Bács-Kiskun (Hungary)	N 671/2008
	Volkswagen Slovakia	Bratislavský (Slovakia)	N 674/2008

Case study	Beneficiary	Region (NUTS 3)	Procedure
Internal business services, Poland	Carlsberg Accounting Service Centre	Miasto Poznań	N 578/2007
	Reuters Europe	Gdański	N 721/2007
	MAN Accounting Centre	Miasto Poznań	N 743/2007
	KPIT Infosystems Central Europe	Miasto Wrocław	N 51/2008
	State Street Services	Miasto Kraków	N 360/2008
	UPS Polska	Miasto Wrocław	N 433/2008
	UniCredit Processes and Administration	Miasto Szczecin	N 338/2009
	Citibank International Plc Oddzial z Polsce	Miasto Warszawa, Miasto Łódź, Olsztyński	N 433/2010
Cement industry, Hungary	Holcim	Komárom-Esztergom	MF 13/2006
	Nostra Cement	Baranya	MF 8/2008
Paper industry, Spain/Portugal	Papelera Guipuzcoana de Zikuñaga (PGZ)	Guipúzcoa (Spain)	N 88/2002
	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	Zaragoza (Spain)	NN 81/2004
	Portucel - About the Future	Península de Setúbal (Portugal)	N 564/2006
	Celulose Beira Industrial (Celbi)	Centro – Baixo Mondego (Portugal)	N 900/2006
	Papeles y Cartones de Europa (Europac)	Palencia (Spain)	MF 57/2007

1.3.3 Approach to data collection

This study draws on data gathered by means of three data collection activities:

Desk research

The aim of the desk research was mainly to collect information on the industry dynamics in the sectors and regions concerned, but also to complement the primary data collected on investment projects. The publicly available documentation on information notices and Commission's decisions about the individual state aid cases was a further source of information.

Interviews with beneficiaries and stakeholders

Interviews focussed on the selected investment project and their overall policy and industry context. In total, about 70 interviews were conducted with granting authorities, beneficiaries, industry experts, regional experts and competitors, both face-to-face and via telephone.

The following table provides an overview of the interviews conducted. A more detailed overview is provided in Appendix 1.

Table 3: Distribution of interviews

Case study	Number of interviews				
	Granting authorities	Beneficiaries	Industry / regional experts	Competitors	Total
Pharmaceutical industry	3	6	3	0	12
Solar industry	4	3	3	1	11
Car industry	5	2	3	3	13
Internal business services	2	7	2	1	12
Cement industry[16]	4	2	2	1	9
Paper industry	4	4	2	3	13
Total	22	24	15	9	70

Interviews with granting authorities
Granting authorities were identified on the basis of the Commission's decisions and desk research. During the interviews with granting authorities, the main topics discussed were the determinants of the investment and location decisions of the beneficiaries from the granting authorities' point of view. General regional development strategies, the rationale for granting aid, the role of the aid in the specific cases and the decision mechanism for the aid decision were also discussed. Finally, the benefits of the investments for regional development were investigated.

Interviews with beneficiaries
Contacts with beneficiaries were established with the help of the granting authorities, who at least provided with contact details of the beneficiary. In the interviews with beneficiaries, the determinants of the investment and location decisions and the role of the aid in these decisions were discussed in a first interview. The impacts of the investments on the beneficiaries' business and on regional development were also discussed. Most interviews were conducted face to face.

Interviews with sector and regional experts
Further sector and regional experts were identified through desk research and in the course of conducting other interviews. Interviews with sector and regional experts provided further insights into the dynamics of the industries, regional development and the role of aid for the relevant industries and regions. Furthermore, because of their looser connection to the granting procedure, sector and regional were able to provide valuable outsider perspectives.

Interviews with competitors
Interviews with competitors were carried out to assess the impact on competition of the aided investments. A total of 92 companies were identified and contacted in order to assess any potential impacts on competition. Of the 17 who reacted to the inquiry, nine were available for an interview. The interviews with competitors were conducted over the phone. Interviewees were asked to assess the influence the competitor's aided investments had on their company's competitive situation, and to provide their opinion on state aid in the context of the RAG.

Potential competitors were identified using the following approach in terms of market demarcation.

- Pharmaceutical industry: the ten leading manufacturers worldwide were contacted as potential competitors.
- Solar industry: the companies contacted are among the biggest manufacturers in Germany or Europe.
- Car industry: companies were selected based on two criteria: 1) membership of the European Automobile Manufacturers' Association (ACEA) and/or 2) they ranked among the 15th biggest car manufacturers in the world in 2010.

[16] The four interviews with granting authorities and one interview with experts on regional development relate both to the case study on the car industry and the case study on the cement industry.

- Internal business services: large European companies from similar or identical industries to beneficiaries were contacted.
- Cement industry: companies were selected based on market share and geographic proximity to beneficiaries.
- Paper industry: companies were selected from the top ten producers in Europe or were large domestic or regional competitors of the beneficiaries.

Survey with beneficiaries

The aim of the survey was to collect specific data on the impacts of the projects on the regions. The aim was to gain insights into three main impact areas: first, the investment's impacts on the company; second, its impacts on the supplier base, and finally its impacts on the client base in the region. Out of the 23 project that proceeded (Five projects were cancelled), 14 could be addressed by mean of the survey.

1.3.4 Approach to analysis

The analytical strategy to answer the evaluation questions builds on a methodological triangulation. This basically means that all "facts" or, in this case, findings from the different analytical units were compared and contrasted to establish and describe in a clear and understandable way:

- common trends across investment projects and case studies, and possible explanations,
- deviations from the common trends and possible explanations,
- extremes and possible explanations,
- illustrative examples for better understanding and more interesting reading.

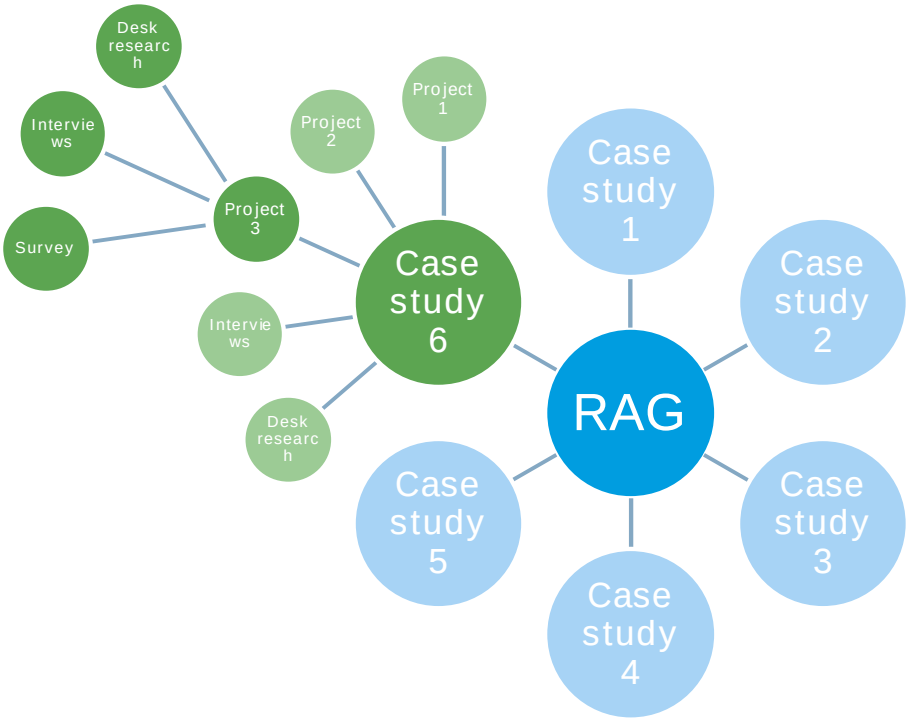
Systematic triangulation was not always possible at the level of each investment project, but the information collected from the different data sources was compiled in summary tables. Analytical tables were also designed for internal purpose, in order to answer to each evaluation question at the level of investment projects. Some of these tables are available in Appendix 2.

Systematic triangulation was applied at the level of each case study, combining and comparing information across investment projects. Additional information on the relevant industry or Member State(s) were also used in order to take into account contextual factors in the assessment of the projects, and to address evaluation questions relating to the impact of aid on competition. Each case study is subject to a specific chapter in this report.

Finally, systematic triangulation was also applied by analysis findings across case studies. This enabled to provide clear answers to each of the evaluation questions at the level of the RAG. Findings are reported in the conclusive chapter of this report.

Figure 4 below is an attempt to outline our analytical approach based on triangulation.

Figure 4: Analytical approach, triangulation



1.4 Limitations to the approach and findings

The findings from the different sources have been combined to answer the evaluation questions. This relates in particular to the verification of findings between different primary sources (interviews with beneficiaries, granting authorities and experts).

There were several challenges in conducting the study. To put the results into perspective, it is necessary to enter the following caveats:

1. This evaluation is based on 28 cases, which make up only a small fraction of all state aid cases. Furthermore, not all beneficiaries could be contacted directly. However, as the cases cut across various industries and Member States, and are complemented by further research, the results can be considered indicative nonetheless.

2. Hypothetical counterfactual situations of no aid being granted (what would have happened, if...) were examined for each case individually. Beneficiaries usually cited a range of reasons other than availability of aid as relevant for investment or location decisions. If the interviewees did not spontaneously mention the aid as relevant, they were explicitly asked to assess the incentive effect of the aid.

3. Some interviewees were able clearly to state what impact the aid had on their decision. However, even beneficiaries themselves were not always able to assess what they would have decided had no aid been granted. In cases where they could not, conclusions are drawn based on other evidence. Additionally, in cases of seemingly clear answers, the conclusions at the end of each chapter are the result of a thorough triangulation across investment projects, thus allowing plausibility checks of the answers. Moreover, the concluding chapter draws on all cases and thus provides consolidated findings.

4. The study was conducted continuously over several months and involved discussions between interviewees and the consultant, and between the consultant and the Commission services. This made data comparison rather challenging at times, due to time lags. This is addressed by indicating the date of data collection in the summary tables presented in this report.

5. In some cases, only a few interviewees were able to comment on any given issue. This decreases external validity of findings to some extent. However, this report clearly points out when caution is advisable in this regard.

6. Quantified evidence of the impact of the investments is mainly based on interviewees' statements (monitoring data collected by the granting authorities were used when available, but monitoring data was most of the time not available). Quantitative data especially on the impact of the investment on the regions usually suffers from serious biases, although they indicate trends that are fully exploited in the analysis.

7. Due to the lack of data, the analysis of the distortive effect of aid for competitors and other regions builds largely on the findings retrieved from the desk research. Rather that strong evidence, answers to these evaluation questions are provided in terms of an ex-post assessment of the risk of distortion of competition, which follows the approach used by the Member States when notifying state aid to the Commission.

1.5 Structure of the report

As mentioned above, each case study is presented in an individual chapter. The concluding chapter of this report draws together the different case study observations in order to identify recurring patterns and relevant differences.

Case study chapters
The report contains six case study chapters. Each chapter is divided into five main parts:

Background
The background section presents information relevant to getting a better understanding of the industry analysed. The description of market dynamics and trends are also necessary to contextualise the investment projects and their outcomes.

Selected sample of investment projects
This section contains descriptive information on each of the aided investment projects. It also includes a description of the investment projects as such, as well as a description of the aid schemes used to support the investments. When possible, the evaluation and decision mechanisms applied by the granting authorities for awarding aid are described.

Determinants of investment and location decisions
The main determinants of the investment and location decisions are listed and analysed in this section. The incentive effect of the aid in these decisions is also analysed separately. Weighting the importance of the investment determinants (in qualitative terms) and defining the relative importance of the aid provides the basis for addressing the first set of evaluation questions (see section 0 above).

Benefits of the investments
This section provides a thorough understanding of the economic and social impacts of the aided investment projects on the beneficiaries, their employees, suppliers, clients and partners, and on the overall region. The cross-comparison of the different observations made by the various stakeholders is essential in answering the second set of evaluation questions.

Impacts on competition and other regions
This section provides with an analysis of the negative impacts of the aided investment projects on their competitors or other regions. The third set of evaluation questions is so addressed.

Conclusions
By summarising the findings in each case, conclusions are drawn for each case study.

General findings
In this concluding chapter, general answers to each of the evaluation question are provided. The structure of the chapter follows the evaluation questions listed in section 1.2.

2. PHARMACEUTICAL INDUSTRY – IRELAND

This first case study looks at the pharmaceutical sector in Ireland. It builds on a selection of seven investment projects.

2.1 Background

This chapter introduces the pharmaceutical industry, providing an overview market trends relevant to the case study. Then the value chain is taken into consideration to introduce the main challenges the players have to face. A more specific section on the European market follows to broaden the analysis to generate wider findings.

2.1.1 Introduction to the pharmaceutical industry

Pharmaceutical is one of the world's largest industries, including approximately 200 major companies and thousands of smaller enterprises[17]. In 2010, the five largest companies, namely Pfizer, Novartis, Merck&Co, Sanofi-Aventis and Astrazeneca, had a combined market share worldwide of more than 25%[18] .

The world pharmaceutical market was worth an estimated €614,583 million ($855,500 million) at ex-factory prices in 2011. The North American market (USA & Canada) remained the world's largest market with a 41.8% share, well ahead of Europe and Japan[19].

Nevertheless, the global trends show that the market is moving towards new balances, with the so-called "pharmamerging" countries rapidly growing in importance from both the demand and the supply side. For instance, in 2011 the Brazilian and Chinese markets grew by more than 20% (20.0% and 21.9% respectively) compared with an average market growth of 2.6% for the five major European markets (France, Germany, Italy, Spain and the UK) and 3.6% for the US market[20].

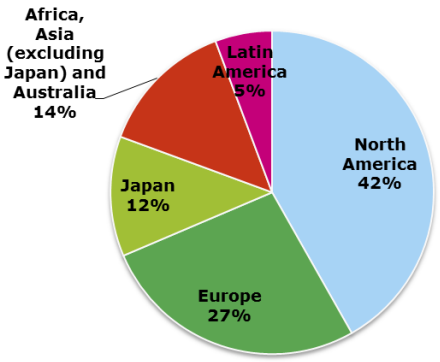
[17] IMS Health (2012). Top-line market data. Available at: http://www.imshealth.com/portal/site/ims/menuitem.5ad1c081663fdf9b41d84b903208c22a/?vgnextoid=fbc65890d33ee210VgnVCM10000071812ca2RCRD&vgnextfmt=default

[18] IMS Health(2012). Top-line market data. Available at: http://www.imshealth.com/portal/site/ims/menuitem.5ad1c081663fdf9b41d84b903208c22a/?vgnextoid=fbc65890d33ee210VgnVCM10000071812ca2RCRD&vgnextfmt=default

[19] Retrieved from: EFPIA (2012). The Pharmaceutical Industry in Figures. Available at: http://www.efpia.eu/sites/www.efpia.eu/files/EFPIA%20Figures%202012%20Final.pdf

[20] Ibidem.

Figure 5: The world pharmaceutical market per sales (2011)[21]



The pharmaceutical industry itself concerns the manufacturing of pharmaceuticals, which two sub-sectors of activity: basic pharmaceutical products (NACE Class 21.10) and pharmaceutical preparations (NACE Class 21.20)[22]. Overall it is a highly globalised, capital intensive and competitive industry[23].

On the *demand side*, the market is characterised by a particular market structure where the final consumer (patient) is not usually the decider (doctor) or the payer (insurance companies or health care systems). This tends to limit price sensitivity on the part of the decision-maker[24].

On the *supply side*, a distinction must be made between originator companies and generic companies[25]:

- *Originator companies* follow the entire value chain, from research into new molecules to product development (pre-clinical and clinical trials), administrative procedures to obtain market authorisation through to sales on the market (from IND to MA in the figure above). For these companies, research and development, marketing and sales account for a large share of total costs, and patents and certificate[26] protections are critical. They mainly compete through non-price means.
- *Generic companies* use a business model based on developing a medicine that is identical or equivalent to originator products. Generic companies market their products as soon as the originator product's patent or certificate expire, with in most cases a significant reduction in price. For these companies, manufacturing costs account for the largest share of costs.

[21] Graph based on data retrieved from: EFPIA (2012). "The Pharmaceutical Industry in Figures". Available at: http://www.efpia.eu/sites/www.efpia.eu/files/EFPIA%20Figures%202012%20Final.pdf, p14.

[22] In 2002, a major revision of NACE (Nomenclature statistique des activités économiques dans la Communauté européenne) was launched. The Regulation establishing NACE Rev. 2 was adopted in December 2006. Pharmaceuticals are covered in Division 21. NACE 21.10 includes: manufacture of medicinal active substances to be used for their pharmacological properties in the manufacture of medicaments: antibiotics, basic vitamins, salicylic and O-acetylsalicylic acids etc., processing of blood, manufacture of chemically pure sugars and processing of glands and manufacture of extracts of glands etc.
NACE 21.20 includes: manufacture of medicaments, manufacture of chemical contraceptive products for external use and hormonal contraceptive medicaments, manufacture of medical diagnostic preparations, including pregnancy tests, manufacture of radioactive in-vivo diagnostic substances, manufacture of biotech pharmaceuticals, manufacture of medical impregnated wadding, gauze, bandages, dressings etc. and preparation of botanical products (grinding, grading, milling) for pharmaceutical use.

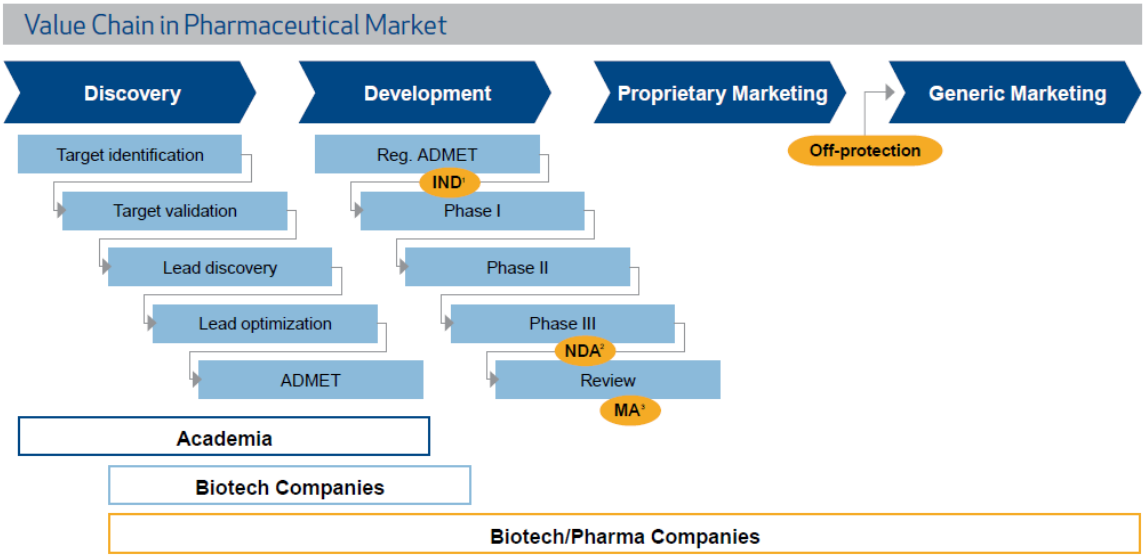
[23] Kasapi,Z. Mihiotis, A. (2011). "Management as applied to New Products Penetration in the Competitive Environment of Pharmaceutical Industry". Interdisciplinary Journal of Research in Business Vol. 1, Issue. 10, (pp.73- 85) November, 2011. Available at: http://www.idjrb.com/articlepdf/idjrb10n1p9.pdf

[24] Charles Rivers Associates (2006), CAR Competition Memo. Available at: http://www.crai.com/ecp/assets/Market_Definition_Pharma.pdf

[25] Ecorys (2009). "Competitiveness of the EU Market and Industry for Pharmaceuticals. Volume II: Markets, Innovation & Regulation". Final Report. Available at: http://ec.europa.eu/enterprise/sectors/healthcare/files/docs/vol_2_markets_innovation_regulation_en.pdf

[26] Supplementary protection certificates (SPC) is a mechanisms established in Europe whereby the term of a patent can be extended after its normal expiry date to compensate for time which is unavoidably lost in placing a product onto the market.

Figure 6: Value chain in the pharmaceutical Market[27]



The research-based pharmaceutical industry is then characterised by high costs and high risks due to the overwhelming role of the research and development process in both time and budgetary terms. The product lifecycle for medicines typically takes products 10-12 years to get to market after patent application for new molecules[28]. It is estimated that only between 1 in 5,000 to 1 in 10,000 interesting molecular entities will eventually be further developed and sold on the market. As a result, the extensive R&D costs associated with developing new medicines can only be recovered by pharmaceutical companies through the price setting of the limited number of new medicines that eventually reach the market[29]. This clarifies the reason for which generic producing companies are growing at a faster pace and challenging the old pharmaceutical industry value chain.

The global generics market is estimated at about $225 billion in 2011. By 2016, it is expected that the value of the total global generics sector will have risen to $358 billion, representing more than 18% of all pharmaceuticals, a projected compound annual growth rate (CAGR) of 9.7% between 2011 and 2016[30]. Given the impact generics are having on prices and margins, a continuous increase in their market share is a key feature of the industry.

In the past twenty years, the pharmaceutical industry has been undergoing structural changes due to some major shifts in the business environment[31]:

- *Patent cliff:* the industry has been relying on a fixed period of patent protection to provide a monopoly on profits as a reward for costly R&D investment. However, the period during which these costs can be recouped has been shortened by longer time to market as a result of increased regulatory controls and barriers to market entry around price and reimbursement. Moreover, while patent cliffs continue to hammer large sales-drivers, the newly launched products are not expected to generate the same amount of

[27] IMAP (2011). Pharmaceutical and Biotech Industry Global Report 2011. Available at: http://www.imap.com/imap/media/resources/IMAP_PharmaReport_8_272B8752E0FB3.pdf, page A-1.
[28] IPHA (2005). Industry Report Pharma Ireland.
[29] Ecorys (2009). "Competitiveness of the EU Market and Industry for Pharmaceuticals. Volume II: Markets, Innovation & Regulation". Final Report. Available at: http://ec.europa.eu/enterprise/sectors/healthcare/files/docs/vol_2_markets_innovation_regulation_en.pdf
[30] BCC Research (2010). "Generic Drugs: The Global Market--Focus on Europe". Available at: http://www.bccresearch.com/report/european-generic-drugs-phm107a.html
[31] Retrieved from: IMAP (2011). Pharmaceutical and Biotech Industry Global Report 2011. Available at: http://www.imap.com/imap/media/resources/IMAP_PharmaReport_8_272B8752E0FB3.pdf

sales[32]. This helps to keep high pressure on the capabilities of financing R&D and constitutes a major concern for the companies[33].

- *Growing regulatory pressure*: ever tougher demands on "pharmacovigilance" systems have been increasing the regulatory burden on Pharma companies' internal systems once the new drugs have been granted marketing authorization. Pharma companies are also under the lens for their marketing practices, forcing them to adapt their promotional models[34].
- *Price cuts:* among which the imposition of price cuts on existing drugs, the raising of standards required to achieve reimbursement of innovative therapies and the use of economic incentives for prescribers and pharmacists to drive a shift to generic alternatives. On top of that, healthcare access and funding being under intensifying pressure as governments try tackle ever rising healthcare costs, decreasing the potential revenues for the Pharma companies from the Public Welfare[35].
- *Emerging markets and globalisation:* The dynamic and high-potential "pharmerging" markets offer tremendous opportunities for drug manufacturers. Big Pharma's drive into a group of high-potential emerging markets has continued to gather momentum, but these opportunities have been counterbalanced by the growing pressure due to the rise of competitors and generic producers. Moreover, patent enforcement in those countries has proved difficult if not impossible, further hindering fruitful market expansion[36].

Big Pharma companies are striving hard to stave off the R&D crisis through mergers and acquisitions, geographic expansion and diversification into new areas such as consumer health care products (for example, baby care, skin and oral care and beauty products). But they recognize that while these efforts yield more predictable sales in the future, they have limited impact on the profit gap. Diversification into other healthcare businesses does not help fill the profit gap either, as "logical" expansions (e.g. to MedTech, diagnostics etc) typically have much lower margins compared with prescription drugs[37].

2.1.2 European pharmaceutical sector

In 2009, the manufacture of basic pharmaceutical products and pharmaceutical preparations was the principal activity of approximately 4,600 enterprises throughout the EU-27 employing over half a million people. In the EU-27, companies with more than 250 employees represented some 10% of the total number of enterprises in 2009, but accounted for more than 84% of EU pharmaceutical (manufacturing) turnover[38].

The structure of the European market recalls then that of the global market, with a small group of leaders and a huge number of SMEs competing for the rest of the market.
In 2011 this market was worth €205,000 million at ex-factory prices, with a positive trade balance of ca. €80,000 million, with a CAGR of 2.6% in the major European markets. The growth rate is thus slower than in the other major markets.

The restructuring of the sector is affecting the number of jobs directly connected to the industry. As shown in the table below, this trend affects also those involved in the R&D sector. The main drivers of this trend are the mergers and acquisition as well as the changes in strategies and core business[39].

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[32] Ibidem.

[33] EFPIA (2012). The Pharmaceutical Industry in Figures. Available at:
http://www.efpia.eu/sites/www.efpia.eu/files/EFPIA%20Figures%202012%20Final.pdf

[34] Retrieved from: IMAP (2011). Pharmaceutical and Biotech Industry Global Report 2011. Available at:
http://www.imap.com/imap/media/resources/IMAP_PharmaReport_8_272B8752E0FB3.pdf

[35] Ibidem.

[36] Ibidem.

[37] Retrieved from: IMAP (2011). Pharmaceutical and Biotech Industry Global Report 2011. Available at:
http://www.imap.com/imap/media/resources/IMAP_PharmaReport_8_272B8752E0FB3.pdf

[38] Own calculation based on Eurostat data.

[39] Retrieved from/ EFPIA (2012). The Pharmaceutical Industry in Figures. Available at:
http://www.efpia.eu/sites/www.efpia.eu/files/EFPIA%20Figures%202012%20Final.pdf

Figure 7: Key figures for the European pharmaceutical industry[40]

INDUSTRY (EFPIA Total)	1990	2000	2010	2011
Production	63,010	123,793	200,050	205,000 (e)
Exports (1)(2)	23,180	90,935	276,357	290,000 (e)
Imports	16,113	68,841	204,824	210,000 (e)
Trade balance	7,067	22,094	71,533	80,000 (e)
R&D expenditure	7,766	17,849	27,796	27,500 (e)
Employment (units)	500,879	536,733	663,503	660,000 (e)
R&D employment (units)	76,126	88,397	117,191	116,000 (e)
Pharmaceutical market value at ex-factory prices	41,147	86,704	153,373	157,300 (e)
Pharmaceutical market value at retail prices	64,626	140,754	222,453	228,100 (e)
Payment for pharmaceuticals by statutory health insurance systems (3)	40,807	76,909	120,650	122,000 (e)

Values in € million unless otherwise stated
(1) Data relate to EU-27, Norway and Switzerland since 2005 (EU-15 before 2005); Croatia included since 2010
(2) Data relating to total exports and total imports include EU-27 intra-trade (double counting in some cases)
(3) Since 1998 data relate to ambulatory care only
Source: EFPIA member associations (official figures) - (e): EFPIA estimate; Eurostat (EU-27 trade data 1995-2011)

The European generic medicines industry consists of more than 700 companies directly employing around 150,000 people in 2011[41]. The European market is estimated to reach nearly $42 billion in 2011 and is expected to increase at an 8.4% compound annual growth rate to reach nearly $63 billion in 2016. Germany is the biggest generics market in Europe, and the second-largest globally, with annual sales estimated at almost $7 billion, or more than 35% of the $60 billion total pharmaceutical market[42].

2.1.3 The pharmaceutical sector in Ireland

As Van Egeraat and Barry (2009) point out, “the development of the Irish pharmaceutical industry has been, and continues to be, a major international success story”. From the Seventies, the Irish government targeted fine chemicals as a key driver of industrial development in Ireland. This led to a series of manufacturing investments, and in the years which followed the sector saw significant growth, although overall manufacturing employment in Ireland had decreased (see also section 2.4.1).

Ireland is now a leading global supplier of pharmaceutical, biopharmaceutical and chemical products. According to the Irish Business and Employers Confederation (IBEC), eight of the global top ten companies had operations in Ireland in 2009; ten of the top-selling drugs were manufactured at Irish sites. The sector contributed more than €1 billion in corporation tax annually. The industry employed 24,500 people directly, and generated 24,500 jobs indirectly

[40] Ibidem, p. 3.

[41] IMS Health (2011). "Generic Medicines: Essential contributors to the long-term health of society". Available at: http://www.imshealth.com/imshealth/Global/Content/Document/Market_Measurement_TL/Generic_Medicines_GA.pdf

[42] BBC Research (2010). " Generic Drugs: The Global Market--Focus on Europe". Available at: http://www.bccresearch.com/report/european-generic-drugs-phm107a.html. Overall, generic penetration is more successful in countries that permit (relatively) free pricing of medicines (e.g. Germany, the Netherlands and the UK) than in countries that have more strict pricing regulation (e.g. Austria, Belgium, France, Italy, Portugal, Spain). This is because in these countries, medicine prices are generally higher, thus providing greater incentive to generic medicines companies to enter these markets. In regulated markets, by contrast, price regulation lowers the originator price over the life cycle of medicines, lowering the potential profit margin for a generic medicine company, discoursing their market entry. See Simoens S. de Coster S. (2006). "Sustaining generic medicines markets in Europe". Research centre for pharmaceutical care and pharmaco-economics.

(based on the provision of services to the sector). Over half the employees were third level graduates[43].

This growth relies heavily on foreign direct investment: in 2008, foreign owned companies contributed to 93% of the direct expenditures of the chemical sector and accounted for more than 90% of employment,[44] while the pharmaceutical industry accounted for about 80% of total sales of the chemical sector in 2008[45]. Ireland's pharmaceutical industry generated more than 25% of the country's exports in 2010[46].

The importance of the pharmaceutical sector in Ireland's exports highlights Ireland's role in a global production network[47]. Indeed, the value chain of the pharmaceutical industry, which is traditionally divided into discovery/research, product development, manufacturing and sales/marketing, is organised globally and Ireland plays a specific role in this value chain.

Initially, the pharmaceutical industry used the competitive advantages of low labour costs, low taxes and a sufficiently skilled labour force to invest in high volume active ingredients production plants in Ireland. From the 90s, however, the sector experienced significant changes. Several blockbuster medicines lost patent protection, which paved the way for the success of low-margin generic pharmaceutical companies[48]. In addition, wages in Ireland rose rapidly during the so-called Celtic Tiger era.

In response, the pharmaceutical industry in Ireland states that it has been focusing on developing activities and capabilities that generate and deliver higher value – by consistently "moving up the value chain"[49]. In particular, investment in active ingredient manufacturing capacities[50] has increased further, but with an increasing role in launch activities, a stronger focus on the last stages of the chemical synthesis cycle, and an increasing use of biotechnologies in the fermentation process. Meanwhile, originator companies started to rely more on smaller volume and higher value drugs for niche markets. As a result, active ingredients manufacturing plants in Ireland received global manufacturing mandates and became the single global source of the Active Pharmaceutical Ingredient (API) for a range of companies' products. The drug-formulation sub-sectors experienced similar trends, although to a smaller extent.

The Irish government supported these changes. It invested heavily in higher education and also strongly supported R&D activities. As IBEC has pointed out, Ireland has one of the best-educated labour forces in the world, and the Irish education system continues to improve and develop. According to a 2010 International Institute for Management Development (IMD) analysis, Ireland is in the top ten in the world for university education attainment, and Irish universities are in the top one per cent of research organisations in the world for 17 fields of science, from immunology to engineering[51].

In the last decade, the chemicals and pharmaceuticals sector in Ireland continued to grow, but this growth did not result in any net increase in employment. From 2005 to 2009, total sales (nominal value) increased by 37%, while total employment decreased by 10%[52].

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[43] IBEC (2011). "*Ireland - The location of choice for scientific investment*"

[44] Forfás (2008). Annual Business Survey Of Economic Impact 2008.

[45] Own calculation: Numbers provided by Eurostat.

[46] IBEC (2011). "*Ireland - The location of choice for scientific investment"*

[47] In what follows, we mainly build on van Egeraat, C. and Barry, F., 2009, "The Irish Pharmaceutical Industry over the Boom Period and Beyond", *Irish Geography*, 42, (1), 23–44.

[48] PriceWaterhouseCoopers (2009). *Pharma 2020: Marketing the future*. See also: IPHA, 2005, *Pharma Ireland Industry Report (IPHA review).*

[49] Ibidem.

[50] Pharmaceutical manufacturing includes: 1) the manufacture of active ingredients (drug substance responsible for the pharmacological effect); 2) drug formulation (physical transformation into the actual tablet, capsule, injection or inhalation material, through combination with other inactive ingredients); 3) other intermediate products as input to these items.

[51] IBEC(2010). "Ireland, The location of choice for scientific investment".

[52] Forfás, Annual Employment Survey 2010.

After an investment peak in 2005, gross investment in tangible goods in the manufacture of basic pharmaceutical products and of pharmaceutical preparations decreased by 44% between 2005 and 2008[53].

The map below provides an overview of the shared services sites and manufacturing sites in the pharmaceutical sector that are located in Ireland. As can be seen, the pharmaceutical sector is strongest in Cork and Dublin. Other counties have significantly lower concentrations of pharmaceutical industries. As will be seen later in this chapter, this has an impact in the investors' location decisions.

Figure 8: Pharmaceutical industry locations in Ireland in 2008[54]

2.2 Selected sample of investment projects

This second section looks at the sample of projects selected for the analysis. It starts with a short description of each project, and then it describes the main characteristics of the projects selected. Finally, in an attempt to understand why these projects were allocated state aid, and also to explain the amount of aid received and eventually paid, the aid scheme is described.

2.2.1 Overview of projects

The case study builds on a sample of seven investment projects. However, of the seven projects, six did not proceed as planned or were cancelled. Only Eli Lilly's project proceeded as planned and this is the only project that received a state aid. (In two projects – Teva and Amgen – the aid was first paid but then reclaimed).

It was not possible to conduct an interview with Servier. Thus, for this case only limited information is available.

[53] Eurostat.

[54] IPAH (2012). Contribution to the Irish Economy. Available at: *http://www.ipha.ie/alist/contribution-to-the-irish-economy.aspx*

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Table 4: Projects in the case study on the Pharmaceutical sector in Ireland[55]

Beneficiary	Region	Instrument	Aid amount (m€, nominal)	Max. aid intensity allowed (NGE)*	Aid intensity awarded (GGE)
Servier (Supram)	South-East	Direct grant	3.9	17.9%	3.9%
Amgen Technology	South-West	Direct grant	15.0	9.9%	5.7%
Pfizer Ireland Pharma	South-West	Direct grant	8.4	6.3%	6.0%
Eli Lilly	South-West	Direct grant	15.0	4.4%	3.7%
SmithKline Beecham	South-West	Direct grant	2.0	4.5%	0.5%
Teva Pharma. Industries (Ivax International)	South-East	Direct grant	5.0	8.8%	7.7%
GlaxoSmithKline Dungarvan	South-East	Direct grant	1.4	7.6%	1.4%

Max. aid intensity allowed: Maximum aid intensity permitted by the RAG
NGE: Net Grant Equivalent; GGE: Gross Grant Equivalent

Servier SAS: project to establish an Active Pharmaceutical Ingredient Facility at Belview Co. Kilkenny:
Servier was proposing to establish an Active Pharmaceutical Ingredient (API) facility to supply manufacturing units within the group, as a new product launch site and strategic back up to their main plant in France. This project entailed an investment of €115 million and the creation of 155 jobs over seven years.

Servier did not proceed with the establishment of an Active Pharmaceutical Ingredient (API) facility as planned due to a global reduction in demand for their products due to generic competition (according to the IDA). This caused a reduction in demand at their existing API facility in France, so there was no longer any need for a second API facility.

Amgen Inc: project to establish a Development & Manufacturing Biopharmaceutical Facility in Cork:
Amgen was proposing to invest €265 million in a strategic development and manufacturing sterile fill finish facility, which would have created 300 jobs. At that time, all Amgen's finished product originated in Puerto Rico where the company employed 1,700 people. Due to the high risk associated with over-reliance on one facility, risk mitigation as well as market growth were key drivers of this project. Initially, the facility was to produce three of the company's leading drugs and one major drug at that time in Phase III clinical trials.

Amgen acquired land and started on the foundations of the new facilities but had to abandon the project because of some issues with the US Food and Drug Administration (FDA) on existing products, as well as the lack of sufficient progress with the product pipeline. Since then, the company has purchased former Pfizer facilities in Dublin, but it still relies heavily on its production site in Puerto Rico. The aid has been reclaimed.

Pfizer: project to establish a Clinical Development and Manufacturing and initial Commercialisation Biologics facility in Ringaskiddy, Co. Cork:
Pfizer was proposing to set up a monoclonal antibody (mAb) clinical development and manufacturing and initial commercialisation facility. This involved an investment of €140m and the creation of 100 highly skilled jobs.

Pfizer had already started the construction works when the company acquired Wyeth in early 2009. The plant became surplus to requirements and was ultimately sold to BioMarin. No aid was paid.

[55] Source: European Commission, State Aid Register (http://ec.europa.eu/competition/state_aid/register/); IDA; *own calculation based on rules laid down in the RAG, 67 (cf. 2006/C 54/08)

Eli Lilly: project to establish a Biologics Manufacturing facility at Kinsale, Co. Cork:
Eli Lilly established a chemical Active Pharmaceutical Ingredient (API) plant at Dunderrow, Kinsale, Co. Cork in 1981 and currently employs 438 people. That facility is an important element in the company's small molecule supply chain. The company planned to spend €400 million on building a biotechnology fermentation and downstream processing facility on the existing site to employ 224 people. The aim is to place Kinsale at the centre of Lilly's monoclonal antibody (mAb) strategy and create a more broadly based Irish operation.

At the time of this evaluation, the project was proceeding.

GSK: project to expand pharmaceutical operations at Carrigaline, County Cork:
GSK established in Ringaskiddy (Country Cork) in 1974 and employed 533 people at the time of the state aid application. This is a strategic global new product introduction site within GSK's manufacturing network and is the sole production site for a number of the Group's top selling drugs. In its project, GSK proposed to invest €377 million in a major expansion of its Cork operation. The investment involved a number of projects, including the manufacture of a new product for the treatment of breast cancer, the construction of a nano-milling commercial facility on the site, and increased capacities for the products in GSK's portfolio.

SmithKline Beecham (the arm of GSK involved) implemented a significant part of its investment plans. However, one of its drugs used to treat diabetes (Avandia) faced a sharp drop in sales after reports of adverse effects, leading to the imposition of sales restrictions by the US Food and Drug Administration and the European Medicines Agency. As a consequence, the initial investment plans were scaled down and, despite significant improvements to its production capacities in Carrigaline, the company still believed it had excess overall capacity and could not create the number of jobs as planned at the site. The aid was not claimed.

Teva Pharmaceuticals: project to significantly automate, and increase productivity and output of the Irish plant in Waterford:
Teva proposed a six-year transformation plan for its Waterford campus which would increase both the scale and scope of both solid-dose and inhaler manufacture businesses, by exploiting synergies, expanding and modernising the production processes, introducing plant-wide automation and IT systems, and deepening R&D activities. An investment of €65 million was planned, which would have resulted in a revenue increase from €167 million to €376 million. Employment would have increased from 625 to 790.

Teva proceeded with the capital investment as planned, in order to increase the Ivax Waterford plant's productivity and output in both solid-dose and inhaler manufacture. However, Teva made further acquisitions of generic companies, including a large production plant in the Czech Republic, resulting in the closure of solid-dose manufacturing in Ireland. Three hundred employees were made redundant in Ireland while, according to the management in Waterford, 900 people were to be recruited at the new Czech site as part of a five-year investment plan. The inhaler part of the business continues to perform satisfactorily, but since there is no longer a solid-dose business and job projections have not been met, the IDA asked for the repayment of aid.

GSK: project to expand pharmaceutical operations in Dungarvan, Co. Waterford:
GSK was proposing to invest €97 million in an expansion of its pharmaceutical operation for the production of new and existing products to aid smoking cessation. The project was to introduce new transdermal drug delivery manufacturing technology to the site and included the construction of a high containment facility for toxic substances.

GlaxoSmithKline Dungarvan proceeded with the planned investment for the production of new and existing products to aid smoking cessation and the new building is operational. However, GSK decided to reorganise its manufacturing operations at the site, including through a cost-containment programme and production transfer of a number of products from the Dungarvan facility to one of its manufacturing facilities in Spain. About 130 positions were to be impacted over the period 2011-2014. Although the activities concerned by the investment were not included in the restructuring programme, IDA did not pay the aids the total headcount on the site

was not expected to increase up to the target set in the aid agreement contracted with the beneficiary.

2.2.2 Main characteristics of the projects

Types of investment

Only Servier and Amgen were planning establishment of new sites. Amgen did not have any operations in Ireland at the time the investment decision was taken. Five of the seven projects related to reinvestment i.e. the upgrading of existing plants. As indicated in section 2.1.3 above, most major pharmaceutical companies have production facilities in Ireland. Hence, it is logical that investment would usually involve existing facilities.

The case of Pfizer differs, however, from the simple upgrade of existing production sites. The company wanted to build totally new biotech production facilities since it at that time had no capacity for the production of complex molecules. So Pfizer was able to choose between the establishment of a new site and the extension of an existing site. Its final decision was to build a biologics facility on the former production site in Shanbally, Ringaskiddy, Co. Cork. The site is located immediately to the west of and directly adjacent to the Pfizer Ringaskiddy site, enabling faster implementation and lower costs. The reasons for this choice are analysed further in section 2.4 below.

Types of expenditure

Investment projects are typically capital intensive (high fixed costs), as they involve the construction of new buildings or the extension and/or modernisation of sites, as well as the acquisition of new production equipment.

However, investment in the labour force is also an important part of the projects, with more than a hundred jobs created for each project. The latter is an important requirement for the IDA, regardless of the type of aid (capital or employment grant).

Activities involved in projects

All investments are global production sites for Active Pharmaceutical Ingredients. The vast majority also involve product launch capacities and three include biotechnological fermentation activities. Thus, most investment projects in the sample are highly representative of the latest trends observed in the pharmaceutical sector in Ireland and described in section 2.1.3 above.

Table 5: Type of activities involved in projects

Beneficiary	Global manufacturing mandates	Active pharmaceutical ingredients	Bio-pharmaceutical fermentation	Launch manufacturing
Servier (Supram)	X	X		X
Amgen Technology	X	X	X	X
Pfizer Ireland Pharma	X	X	X	X
Eli Lilly	X	X	X	X
SmithKline Beecham	X	X		X
Teva Pharma. Industries (Ivax International)	X	X		
GlaxoSmithKline Dungarvan	X	X		

2.2.3 State aid scheme and project selection

2.2.3.1 Presentation of the aid scheme

The granting authority for the projects in scope of this evaluation is the Industrial Development Agency of Ireland (IDA). The IDA was established in 1949 to focus on bringing new overseas business to Ireland and to promote the expansion of the existing base of overseas companies. The IDA administers support schemes, grants and other financial facilities.

Available financial incentives used by IDA include investment grants, training grants, and research, development and innovation grants. The project sample analysed concern investment grants only, either employment or capital grants, awarded under the existing scheme XR 12/2007 "Regional Aid (Industry and Services) Scheme 2007-2013" covered by the General Block Exemption Regulation[56].

These grant types are regional aid and focus on investment in assets. Sometimes the grants are approved as a capital grant with a performance clause which ties the aid to the creation of jobs and sometimes the grants are paid as employment grants with a requirement to comply with the implementation of a fixed asset programme. The awarding conditions are the same in both grant types. Only the methodologies for paying the grant differ[57].

2.2.3.2 Projects evaluation

Evaluation process and criteria

A potential beneficiary must submit an application to the IDA for assistance. This application usually occurs after a dialogue between the IDA and the investor, which prepares the ground and helps in assessing whether aid is likely to be made available. IDA Ireland does not hold competitions with defined closing dates for Regional Aid funding.

Using the project appraisal information, the relevant IDA project executive may submit a recommendation on the eligibility of the project and the level of aid to the Board or appropriate Committee of the IDA and the Government.

According to the documentation provided by the IDA, Considerations when evaluating a project are: company development plan; commercial viability; employment created; level of financial assistance sought; equity base.
Criteria when determining the appropriate level of incentives are: quality of promoter; regional impact; level and quality of employment; integrated business entities; strategic importance.

From IDA's answers, it does not seem that these criteria are formally defined. Rather, it appears that they constitute a flexible assessment framework. Moreover, the aid amount is subject to negotiation between the IDA and the investor.

The Board of the IDA, with the approval of the Minister, has delegated certain of its powers to approve incentives to the Investment Committee of the Board and to the Management Investment Committee. Depending on the total level of incentives, a package is approved by one of these committees or the Board of the IDA. If the total level of proposed incentives or the total of a particular proposed aid amount exceeds the limits laid down by IDA legislation and State Aid Rules, the permission of the Government or the European Commission is requested.

IDA cost-benefit model

To assist in deciding whether to provide support for enterprise development projects, and to what extent, an economic model (cost benefit analysis) has been developed and is used to assess investments in receipt of capital and employment grants. The model involves obtaining projections of tangible benefits and costs for the project, assessing the project's added value to the Irish economy, and calculating the net benefits of the project.

The economic model looks at the net present value of benefits divided by the net present value of costs.

[56] The legal basis for this aid scheme is: Industrial Development Acts 1986-2003; Údarás na Gaeltachta Act 1979; Shannon Free Airport Development Company Limited Act, 1959 as amended; Greyhound Industry Act, 1958. It is a multi-sectoral regional investment scheme running from 01.01.2007 to 31.12.2013, with an annual budget of €85 million (the summary information sheet was published in OJ C 189, 27.7.2008).

[57] The capital grant is paid on the basis of the company's expenditure on fixed assets, land, buildings and plant and machinery. The employment grant is paid by way of a per job subsidy for each job created in the company

Table 6: Economic Model, Net present value of benefits and costs

Benefits =	Costs =
Direct wages & profits + **Indirect wages & profits +** **Taxes on direct & indirect profits +** **Taxes on direct & indirect wages +** **Reduction in deadweight costs of taxation**	Grant amount + Deadweight costs of taxation

The fundamental purpose of the model is to ensure that support provided by the agency will yield benefits to Ireland in excess of the associated costs. The benefit to cost ratio must be greater than 1:1 in order for the project to be approved. In practice, the benefit to cost ratio is generally always in excess of 1:1.

According to the IDA, the direct Irish profit is estimated based on the projected activity, costs, sales etc. of the company. The indirect wage bill and the indirect Irish profit are also calculated by the economic model, using the supply-use tables of the national accounts at sector level. This means that sectors or projects offering lower value to Ireland are not assessed as positively as projects offering higher value, and thus receive lower aid amounts.

2.2.3.3 Aid amount and intensity level

Aid intensity policy

The amount of aid is based on the criteria mentioned above, supported by the cost-benefit model.

In the case of the manufacture of pharmaceuticals, the average aid intensity is significantly lower than the authorised thresholds (see also Table 4 above). According to IDA, this is explained by the need to comply with budget constraints. The aid amount also depends on IDA's bargaining position for specific investments projects.

As mentioned above, the aid amount is subject to direct negotiation with the investor. In this bargaining process, the starting position of IDA is that the world-class pharmaceutical cluster in Ireland offers strong location advantages, and the granting authority expects investors to value them at their true worth. In addition, IDA is striving to ensure continuous dialogues with pharmaceutical companies and support to investors looking for the right location. On this basis, it is IDA's view that financial aid does not necessarily need to be high, but carefully set at its appropriate level, as part of a global and assumingly attractive package to investors.

According to IDA, higher aid amounts can be justified by the value offered by the project to the Irish economy in terms of the benefits listed in Table 6 above, but also in terms of territorial cohesion when the investment is located in a disadvantaged region. Higher aid amounts are also an indicator that the bargaining power of the Irish authorities is weaker, due to a higher probability that without state aid, investment would locate in another country.

In the case of the pharmaceutical industry, the IDA acknowledges that all major fixed investments in the sector receive aid. This is because, according to interviewees, the IDA is very confident that there will be a payback from major pharmaceutical companies in terms of taxes (primarily), jobs and direct expenditures. Therefore, Irish authorities pay considerable attention to attracting major pharmaceutical companies' investments. They want to be as competitive as possible in face of intense competition from Puerto Rico, Singapore and to some extent Switzerland, where tax rates are considerably lower.

Aid allocated

Following the criteria set by IDA to determine the appropriate level of incentives, variations in the level of aid in the project sample can be explained as follows:

- *Regional impact:* the pharmaceutical sector and the general economy are weaker in Co. Kilkenny and Co. Waterford than in Co. Cork. Hence, investments locating in the South

East (Kilkenny, Waterford) tend to receive higher aid than investments locating in the South West (Cork) region. No project in the least developed Border, Midland and Western region was included in the sample.

- *Level and quality of employment:* Large investments involving creation of a large number of jobs are encouraged. Thus, projects offering high value tend to receive higher aid, as is particularly the case in projects involving biotechnology (Amgen, Pfizer and Eli Lilly).
- *Strategic importance:* Amgen and Pfizer, two of the largest pharmaceutical companies in the world, were seeking to set up new biopharmaceutical facilities to supply other companies' plants worldwide. Hence, these investments were highly strategic for Ireland, which is also pushing for investment in biotechnology. This justified higher aid levels.

As said above, another criterion that influences the level of aid awarded, but that is not a formal criterion, is the bargaining power of the IDA when negotiating with investors. From evidence collected during interviews, it appears that weaker bargaining power, due to strong investor back up options, has led to higher aid. In the project of Amgen, for instance, the company had no pre-existing operations in Ireland at the time the decision to invest was made, and it was looking with an open mind at different possibilities worldwide – with Singapore as the main alternative location. Hence, the IDA was willing to invest for Ireland to be competitive enough and anchor the investment in the country.

Another example is Teva: when the investment project was maturing, the company had just purchased Ivax, another generics company. The Irish management was struggling to convince the board of Teva that investing in the Waterford plant would increase the productivity of the site to an extent such that it could compete with other low-cost locations in the company (the main alternative location was Eastern Europe). In an attempt to support the investment project, IDA offered a high level of aid.

Agreement and payment

Where an incentive package is approved, a "grant agreement" is signed between the IDA, the Irish legal entity and its parent company.

The aid is paid once the company has incurred the relevant expenditure. The claim is examined to ensure that it has been completed in full, is accompanied by an independent accountant's report on the expenditure and that the necessary documentation is included. In the case of capital investment grants, project completion is not only conditional on capital expenditure targets, but also on employment targets in terms of the number of jobs created. This is closely monitored by IDA.

In the event the grant agreement objectives are not met, IDA does not proceed with the payment or seeks the repayment of aid paid. It is not IDA's practice to renegotiate the aid amount for partly achieved or delayed projects. This explains why, at the time of writing this report, only one project had received due grants, while the others did not claim the grant or were advised to repay the aid.

2.3 Determinants of investment and location decisions

This section analyses the beneficiaries' determinants for 1) their decisions to invest as such, and 2) their decisions on the location of their investments. In both cases, the influence of the financial aid on these decisions is discussed.

2.3.1 Determinants of investment decisions

2.3.1.1 Main determinants of investment decisions

According to interviewees, the main drivers of the beneficiaries' investment decisions were the following:

Growing demand: All projects were motivated to some extent by the need to increase capacity in a context of full and growing pipelines. Investment plans were initiated in a context when

growth was expected, driven by sales of 'blockbusters', which in spite of an increasing number of products going off patent, remained a source of high revenues in some cases.

Among the most illustrative examples of such an investment driver is GSK's project in Carrigaline, Co. Cork, which consisted of a major expansion of its operation, to provide for increased capacity for the products in GSK's portfolio. Another example is GlaxoSmithKline's investment in Dungarvan, Co. Waterford, which was mainly driven by the necessity to provide GSK with the production capacities to satisfy an increasing demand for smoking cessation products.

Another source of increasing demand was the rapidly growing biotech sector. This offers new opportunities for developing, producing and commercialising biotech pharmaceutical drugs, and an increasing rate of product introduction, as blockbuster drugs (going off-patent) are tending to be replaced by higher-value drugs for niche markets. These are analysed below.

New technologies available: Fast developing technologies and opportunities incentivised pharmaceutical companies to increase their capacity to manufacture biopharmaceutical products. In four out of six projects, increasing production capacity in advanced biotechnology was a key driver of the investment.

For instance, Pfizer decided to invest in new production facilities as the company wanted to acquire capabilities in biotech. Up till then, the company had been focusing on small molecules, and had been relying on outsourcing for the production of larger molecules. Hence, the objective was to acquire capacities of its own, in order to have more control over these products.

Another example is Eli Lilly. The company's operations in County Cork had been focusing on small molecules. The board's decision to invest in research and manufacturing facilities in Ireland was mainly driven by the need to move towards modern biotechnology. Seen from the angle of the Irish management – who initiated the investment project and made a proposal to the board – it was also a matter of enhancing the competitiveness of the production site within the group (see also below).

Need to increase efficiency: The pharmaceutical sector in Ireland has been facing global competition with other production facilities. In the manufacture of Active Pharmaceutical Ingredients (API), this comes mainly from Puerto Rico and Singapore, but there is also competition from India and China (mainly for drug formulation activities). In this context, the rising cost of doing business in Ireland has been an increasing concern since the early part of the last decade.[58] The pharmaceutical industry needs to combat these difficulties with increased productivity (through new processes and equipment), but also through higher value activities (R&D, product development and launch manufacturing) and the use of modern biotechnology in manufacturing processes. In four of the six projects, the need to increase the competitiveness of the manufacturing plants within the company was an important investment driver.

Teva Pharmaceuticals' project is a clear example of increased productivity being a key investment driver. This was a strategic project aiming at increasing and exploiting synergies, expanding and modernising the production processes of both solid-dose and inhaled products. The reason behind it was the need to increase the competitiveness of the plant after Ivax was acquired by Teva, a company specialised in generic products. When acquiring Ivax, Teva appropriated the companies' unique expertise in respiratory products, but there was no guarantee that the production of solid tabs would be maintained on the site due to higher costs compared to other Teva manufacturing facilities in other parts of the world. The Irish management then made a strategic competitiveness proposal to the board of Teva Pharmaceuticals with the aim of significantly automating the Irish plant, and increasing productivity and output.

Increased productivity through modern processes and equipment, and increased production capacities was also a key investment driver of GlaxoSmithKline Dungarvan Ltd.

[58] Forfás & the National Competitiveness Council (2011). Annual Competitiveness Scoreboard 2011. According to the report, the Harmonised Competitiveness Indicator increased from ca. 80 in 2001 to ca. 105 in 2008.

Another striking example is SmithKline Beecham's project in Carrigaline, where the existing plant aimed to acquire a new multi-product launch plant. The purpose was to acquire more flexibility in order to manufacture smaller quantities of a larger number of products, hence addressing one of the challenges posed by the decreasing number of blockbuster drugs (going off-patent) and replacing them by higher-value drugs for niche markets (see also section 2.1.3).

In the projects of Teva, SmithKline Beecham and Eli Lilly, the site's competitiveness was also to be increased by acquiring or strengthening a technological competitive advantage in their global production networks.

New products in the pipeline: In the face of the changes in the industry's technological and competitive environment, the pharmaceutical industry must constantly innovate. The rate of product introduction has been increasing, hence requiring additional and/or specific technological capacity. As already considered, manufacturing plants in Ireland have been focusing increasingly on launch manufacturing, as the introduction of new products (and related process development activities) require a highly skilled work force. Hence, the increasing number of products in the pipelines has created opportunities for the Irish plants to increase and improve their capacities in order to address the requirements in terms of manufacturing processes and volumes. In four of six projects, new products in the pipeline were important investment determinants.

This was the case of Amgen, for instance. Its new facility in Ireland was designed to produce three of the company's leading drugs and one major drug in Phase III clinical trials. This was also the case of SmithKline Beecham. The investment involved a number of projects, including the manufacture of a new product for the treatment of breast cancer.

2.3.1.2 Incentive effect of the aid on the investment decision

Decision mechanisms

For the projects analysed, it is possible to distinguish between projects where the decision to invest at all was taken by the board alone (top-down), and projects where the production sites also took a role in initiating this decision (bottom-up).

In Teva's and Eli Lilly's projects, the investment was initiated by the Irish site as a strategic move to maintain the plant's competitiveness on the global market. In Teva's project, the aim was mainly to increase the site's competitiveness through higher productivity. At Eli Lilly, the objective was to acquire biotechnological capacities in order become the centre of Eli Lilly's strategy on modern biotechnology.

In SmithKline Beecham's project, the investment decision followed a mixed approach. Parts of the project (increased production capacities for best-seller products and a new nano-milling commercial facility) were initiated by the Irish management, which wanted to undertake strategic expansion. However, another part of the project (new product launch) involved a competitive capital investment programme launched by the parent company.

All interviewees stated that they were aware of the possibility of receiving aid before the investment decision was taken. However, because interviewees were involved at different stages of the decision, and because the final aid application is the result of an on-going dialogue with IDA, it is not always clear whether the definite amount of the aid was known before the investment decision was taken. Only in the projects of SmithKline Beecham and Teva, is it clear that this definite amount was known. In the other projects, given the close contacts with the IDA, it is also highly probable that all the companies had an idea of the approximate amount of the aid that they could expect.

Aid incentives

In no projects, with the particular exception of Teva, did interviewees state that the aid was a key investment driver. Interviewees also had difficulties assessing the extent to which state aid actually matters in a decision to invest, as it is considered to be a small part of a whole package.

All the investment projects analysed are capital intensive and highly strategic projects, and it appears reasonable to say that the aids had only a very limited impact on the decisions to invest.

Only in the case of Teva did regional aid come in support of the investment decision. The investment project was initiated by the management locally in order to enhance the productivity of the manufacturing plant in Waterford, and its competitiveness within the Teva group. Hence, the investment project design by the Irish management and its potential financial returns were carefully assessed by the board, and in that sense the regional aid was a positive contribution to the final decision. While the investment decision was also a decision to invest as such, Teva acquired additional production capacities in Central and Eastern Europe during the decision phase, and it then became very clear that there was a trade-off between investing in the Irish plant or relocating activities to Central and Eastern Europe, where further investments were also planned. The incentive effect of the aid on the location decision is described further in section 2.3.2 below.

The outcomes of the projects selected confirm that the incentive effect of the aid is very limited. Indeed, the aid had no impact on the decision to implement the investment as planned, in spite of the certainty for the investors of losing the benefits of the aid. In six out of seven projects, the investors changed their plans and lost the aid. It should however been acknowledged that IDA's approach does not create any lock-in effect: it is not IDA practice to renegotiate the aid amount where targets are partially met (e.g. the payment of a grant on a pro-rata basis). Hence, there is no incentive for investors to carry out a portion of or sustain their capital or human investments in such a way that they could secure at least part of the aid amount.

No project could be identified where financial calculations were carried out to compare investment returns with and without the aid. As interviewees indicated, the Net Present Value calculation is a common practice. However, this is part of the usual financial assessment to capture the financial benefits of the project, not the minimum amount of aid that would make the investment profitable.[59]

2.3.2 Determinants of location

2.3.2.1 Main determinants of location decisions

The following factors influenced the location decision of the beneficiaries (in order of decreasing occurrence):

Pre-existing operations: In five out of six projects –the exception is Amgen – the companies already had production facilities in Ireland, and this is how the investment location was selected.

This determinant was highly decisive when selecting the *country* of investment. In general, past experience in the manufacturing of pharmaceutical products in Ireland was a strong location incentive, as it implied lower risks than completely new locations. In the case of Pfizer, for instance, it was clear from the early stages in the process that they wanted to establish their biotech facilities in a country where they already had operations, and this is why Ireland was selected.

Pre-existing operations in Ireland were also a strong location determinant when the Irish facilities had a strong track record. This was the case of Eli Lilly and SmithKline Beecham for instance, which managed to attract investment in Ireland thanks to their long history and good performance.

The choice of a specific *region* in Ireland was also strongly determined by the existing locations of the companies. In most cases, no alternative to existing locations in Ireland was considered, as most projects involved the transformation or expansion of existing facilities, in order to benefit from internal economies of scale. Only in the projects of Amgen and Pfizer were several locations

[59] In other words, assessing whether there was a need for a grant or assessing the financial impact of a grant was not part of the rationale in the projects analysed.

in Ireland considered[60]. Pfizer finally decided to locate its biologics facility on a site that is located immediately to the west of and directly adjacent to the existing Pfizer Ringaskiddy site. According to the investors interviewed, investments in existing plants involve lower risks, lower costs and faster implementation. The IDA also acknowledges that pharmaceutical companies "do not like" the establishment of new sites in new locations.

Availability of skilled labour force is also of importance. Most projects involved Active Pharmaceutical Ingredients (API), biotechnology and launch manufacturing, which require complex processes and specialised skills. Ireland is one of the few places in the world that can provide the necessary skilled and educated labour force. Hence, in five out of six projects, interviewees mentioned the *qualitative* availability of labour force as a decisive factor.

For instance, Teva felt that one of the decisive factors for investing in the Waterford facility was its unique expertise in inhaled products (Active Pharmaceutical Ingredients). In only one case, did the interviewee mention the *quantitative* availability of labour force. This was Amgen, which planned to recruit 300 people for its new production facility and wanted to proceed quickly. However, it is fair to say that most interviewees also had the quantitative dimension in mind, as investments need to achieve a critical mass.

Existing cluster: The presence of a world-class pharmaceutical cluster in Ireland is a decisive factor for the companies to keep investing in the country. Although the pharmaceutical industry is facing challenges in sustaining and developing manufacturing activities, Ireland still offers a favourable environment for on-going development. In characterising the leading cluster in pharmaceuticals, interviewees referred not only to the highly skilled and educated labour force, as mentioned above. They also mentioned specialised suppliers, including in the local construction sector (with the expertise to assemble complex production facilities), the biotech sector and high profile universities offering tailor-made programmes and training facilities (e.g. the FAS Pharma/Biopharma Process Training Facility in Cork). The government continues to invest heavily in the sector, especially in R&D activities, which offer the highest potential for competing against other leading pharmaceutical clusters worldwide, and attracting foreign direct investment.

The pharmaceutical sector in Ireland is strongest in Cork and Dublin; other counties have significantly lower concentrations of pharmaceutical industries. This had an impact in the investors' location decisions in Ireland. In particular, the three bio-pharmaceutical fermentation facilities decided to locate in Cork (Amgen, Pfizer and Eli Lilly). According to IDA, it is extremely difficult to attract biotechnological investments away from Cork and Dublin, due to strong agglomeration economies in the sector.[61]

Cost of labour: In five of six projects, the relatively cheap labour force was mentioned as an important factor for locating the investment in Ireland. Despite the fact that labour costs were increasing steadily at the time of the decision, interviewees acknowledged that Ireland has remained competitive in this regard.

Business environment: In three projects, interviewees mentioned the pro-business environment offered by Ireland. For instance, low corporate taxes were a decisive factor for Ivax to convince Teva's senior management that Waterford should be the site for investment: production costs are particularly important in the low-margin business of generic drugs.

Other location determinants cited by interviewees included accessibility to the company's headquarters (e.g. direct flights to the US in the case of Eli Lilly, proximity to the UK in the case of SmithKline Beecham) and a common language (in the case of Amgen and Eli Lilly).

[60] Selection criteria included the size of the land to enable future extensions as well as the quality of infrastructures such as large-scale water filters and roads. As far as Pfizer is concerned, the company considered County Dublin as an alternative location, but the county appeared to be landlocked and offered no adequate location at a reasonable cost.

[61] The biopharmaceutical sector relies on small innovative companies that supply manufacturing plants. The sector also requires specific skills, and companies would rather avoid the risks of settling away from universities and areas where they can find specialised labour force.

2.3.2.2 Incentive effect of the aid on the location decision

Alternative locations[62]

According to all interviewees, Ireland's main competitors for advanced pharmaceutical operations are outside Europe, and in all projects *alternative locations outside the EU* were considered. In the sample analysed, Puerto Rico and Singapore were the main alternatives to Ireland. Other locations such as the US, the UK, Switzerland and Israel were also mentioned, usually because of their relationship with the headquarters location or existing facilities. India was mentioned in a couple of projects involving lower added-value production activities (drug formulation) and where operating costs play a more important role.

According to interviewees, Puerto Rico and Singapore also offer financial incentives for investment, including grant aid and negotiated tax rate reductions, which combined with lower labour costs makes them extremely competitive. In Switzerland, tax rates can be negotiated with the Cantons.

In only one project, were *alternative locations in another EU country* considered: when Teva acquired Ivax, the generic pharmaceutical company had the choice between investing in the Irish plant in Waterford or in other locations offering lower labour costs, including Eastern European Countries. Thus, alternative locations in this case were more disadvantaged EU regions.

In two projects, *alternative locations* in Ireland were also mentioned: Pfizer considered County Dublin, while Amgen considered Waterford. In both projects, a new establishment (so-called Greenfield investment) was initially envisaged, but Pfizer finally decided to invest on a former production site. Both companies decided to locate their investment in County Cork.

Aid incentive

When looking at the decision to *invest in Ireland* rather than in any other country in the EU and worldwide, interviewees agree that the availability of state aid matters. However, they see the aid as part of a competitive package, within which it is not possible to isolate impact of the aid on the location decision. Thus, in all projects, other location factors outweigh the aid factor.

Internal competition occurs within the pharmaceutical companies themselves in order to attract investments. Production sites compete with each other to attract new products, R&D activities and investments from the parent company. In such circumstances, the Irish sites have to convince senior management at group level that it should be the site for investment. The different locations are then subject to strategic and financial assessment by the board, including a careful analysis and comparison of the expected return on the investment.

This was clearly the case of SmithKline Beecham in Carrigaline, for example, since the plant applied for a competitive capital investment programme. This was also clearly the case of Teva Pharmaceuticals' project, where the Irish management had to fight hard to convince the board of the generic company to invest in its newly acquired facility in Ireland rather than transfer its activities to a low-labour-cost location in Eastern Europe, where Teva was also investing. In this particular case, the interviewee deemed that availability of the aid was an important argument for Teva in considering investment in the Irish plant.

However, the case of Teva also shows that the incentive effect of the aid is limited. Indeed, when Teva made further acquisitions of generic companies, including a large production plant in the Czech Republic, it revised its plans and decided on closure of the solid-dose manufacturing plant in Ireland. The fact that the aid would have to be repaid to IDA did not prevent Teva from taking this decision.

When looking at the decision to *invest in one specific region* in Ireland, no project could be identified where the aid influenced the location choice in Ireland, in spite of the higher financial

[62] Here, we build mainly on information collected during interviews, but all this is confirmed by secondary sources as well. See for example IPHA (2005).

incentives offered by IDA to companies that invest in the less developed regions. This leads to the conclusion that in the projects analysed, the aid had a limited impact on the location decision within Ireland.

2.4 Benefits of the investments

The only project considered during this study which progressed to completion was Eli Lilly's and this project is still proceeding. Part of the investment was undertaken, but most projects were discontinued or terminated before completion. In two projects (Teva and Pfizer), the aid was paid but then reclaimed due to a lack of progress with headcount.

Table 7: Project status and achievements[63]

Beneficiary	Status	Planned				Achieved*			
		Aid (m€)	Invest. volume (m€, nominal)	New jobs	Aid/ new job (k€)	Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/ new job (k€)
Servier (Supram)	Cancelled	3.9	115	155	25.0	0	0	0	0
Amgen Technology	Cancelled	15.0	265	300	50.0	0	n/a	0	0
Pfizer Ireland Pharma	Cancelled	8.4	140	100	84.0	0	n/a	0	0
Eli Lilly	Proceeding	15.0	400	224	67.0	3.40	n/a	140**	N/A
SmithKline Beecham	Partly completed	2.0	377	136	15.0	0	250	(121)	0
Teva Pharma. Industries (Ivax International)	Completed (but job targets not reached)	5.0	65	165	33.0	0	65	(115)	0
GlaxoSmithKline Dungarvan	Completed (but job targets not reached)	1.4	97	135	10.0	0	97	61	0

Aid (m€): Total aid amount in million Euro
Invest. volume (m€, nominal): Total nominal eligible investment sum in million Euro
New jobs: number of jobs created
Aid/new job (k€): Total aid amount per job created in thousand Euro
Euro equivalent calculated based on exchange rate on the date of the notification
figures in () indicate a reduction in the number of jobs at the site

Since the cut-off date in the table, Eli Lilly has continued to move ahead with its investment project as planned, and had created 140 new jobs by June 2012.

As can be seen from section 2.2.1, the projects did not necessarily proceed as planned. According to IDA, the sample is a good reflection of the situation in the pharmaceuticals industry. The pharmaceutical sector is strong but also highly competitive. While the generic drug business on the one hand and biotech technologies on the other are successful, pharmaceutical companies need constantly to be innovating and developing new products. This development activity is high-risk and filled with uncertainties. In addition, the sector has experienced mergers and acquisitions, and major changes have been seen in Ireland in the past years. The situation depicted by the sample is also a good reflection of a sharp decline in investment in Ireland during the same period. After an investment peak in 2005, gross investment in tangible goods in the manufacture of basic pharmaceutical products and of pharmaceutical preparations decreased by 44% between 2005 and 2008[64]. This can be seen as a combined result of a decreasing number of

[63] Source: European Commission, State aid register; *IDA (31st December 2010); **Beneficiaries (June 2012);
[64] Eurostat

potential blockbuster drugs in the pipeline, a search for productivity gains in the industry as well as the broader 2008 financial crisis.

Due to the fact that the aid had no or a very limited impact on the investment and location decisions, the following sections describe the benefits of the investments.

2.4.1 Effects on direct jobs

Gross change in direct jobs

There are two projects in which there was gross job creation. GlaxoSmithKline Dungarvan completed the project as planned and had created 61 jobs on the site by December 2010. Eli Lilly was proceeding with its project and reported the creation of 140 jobs until June 2012 (41 until December 2010). However, at SmithKline Beecham (project completed partly) and Teva (project completed) there was a decrease in the number of jobs at the site.

The relatively low number of jobs created has been explained above. When looking more specifically at each investment projects, explanations are:

- *Reduced pipeline:* The development of new products in the pharmaceutical industry is a lengthy and costly process with uncertain outcomes (only a tiny proportion of drugs tested enters clinical trials and ultimately receives the right to be produced and marketed to the public). Hence, sharp strategic turns are customary in the sector. This is the context that resulted in Amgen, SmithKline Beecham and Servier revising their initial plans.
- *Acquisitions and restructuring:* In the case of Pfizer, GlaxoSmithKline Dungarvan and Teva, restructuring disrupted initial plans. In the two latter projects, the construction work was achieved but the initial recruitment plans could not be fulfilled; especially, the targets in terms of the gross number of jobs created at production sites could not be reached.
- *Overall market downturn*: As said above, all investment projects have been implemented in a context marked by a decreasing number of potential blockbuster drugs in the pipeline (some of them going off-patent) and a search for productivity gains in the pharmaceutical industry.

Hence, these outcomes have to be compared to the baseline. Between 2005 and 2009, employment in the chemical sector (of which Pharma is a significant component) decreased by 10 per cent[65].

Jobs safeguarded

Beyond the low outcomes in terms of the gross number of jobs created, a closer look at the projects indicates that in at least three of the six projects, investment enabled jobs to be safeguarded at the site or compensated (potential) job losses elsewhere[66].

In the case of Teva, the inhaler part of the business benefits strongly from the investment. Capacities and outputs in respiratory products have doubled in the last 4-5 years. The site has acquired capacities that are highly competitive and unique in the entire Teva group. This secures jobs in the long run. The Irish site is now investing in R&D and is competing internally with the research operations in Jerusalem to attract more R&D activities. (Teva's headquarters are located in Israel).

The case of Teva is a clear example of the difficulty of keeping jobs in Ireland despite levels of public aid and investment. Although its investment project was completed, the Irish plan was not able to compete with the Czech[67] and Hungarian manufacturing sites. When Teva acquired the generics company Barr-Pliva only a few months after the capital investment in Waterford was completed, the generics company decided to integrate its activities in Eastern Europe. The solid-

[65] Forfás (2010). Annual Employment Survey 2010.

[66] In its grant agreements with investors, IDA takes into account the gross number of jobs created. It does not take into account jobs safeguarded.

[67] Teva Czech Industries s.r.o. is headquartered in the north-eastern part of the Czech Republic in Opava-Komarov

dose business in Ireland was closed down and 300 jobs were lost. In the meantime, Teva concluded a deal with the Czech authorities for a five-year investment plan to set up generic manufacturing facilities providing 900 jobs[68]. The main reason for investing in the Czech Republic rather than in Ireland was lower labour costs, which as noted previously are key in the low-margin business of generic drugs. Although no precise information could be obtained on the incentives offered by the Czech authorities, the single source consulted deemed that financial incentives (grants and tax reductions) several times higher than what could have been obtained in Ireland were offered to Teva. The negotiation also involved active lobbying at the highest political level. This was of course a setback for the Irish site management, but this decision affected solid products only: due to the investment, the Irish site increased its competitiveness in inhaled products and secured its dominant position within the group.

Another example is GlaxoSmithKline Dungarvan, which completed its investment project but then decided to reorganise its manufacturing operations at the site, including production transfer of a number of products from the Dungarvan facility to one of its manufacturing facilities in Spain. The activities concerned by the investment were not included in the restructuring programme. According to the beneficiary, this indicates that the investment contributed to the sustainability of jobs at the site, although IDA considered that the beneficiary did not meet its obligations in terms of job creation (the production transfer concerns 130 jobs), and then considered the investment plan as not fulfilled.

A last example is SmithKline Beecham, which increased its competitiveness within the group thanks to new machines and processes. As a consequence, the Irish site in Cork has attracted new products to be manufactured in Ireland (internal bid process). Thanks to increased flexibility and productivity, it has also managed to attract a product from India (Atovaquone)[69]. This of course contrasts with the decrease of the number of jobs at the site and may indicate that the aided investment contributed to safeguard jobs.

Quality of jobs and training

The projects mentioned above are good examples where the quality of jobs improved as a result of investment, and they mirror a general trend in the pharmaceutical industry in Ireland noted above, i.e. pharmaceutical companies established in Ireland tend to move up the value chain. They develop, along with manufacturing activities, strong capacities and a pipeline in R&D and product development (pre-clinical and clinical trials), launch manufacturing and biotech-based products. While offering high business potential, these activities also involve complex activities and processes, and require a highly skilled labour force[70].

One example in terms of improved quality of jobs is Eli Lilly. During the investment phase, the company has been spending some €4-5 million on training in order to make its labour force operational. Indeed, in the case of Eli Lilly, 50% of the jobs created for the new biotech facility are be retooled employees working previously on the manufacturing of small molecules, which is also a good example of how quality of employment (high-value jobs) is linked with the sustainability of jobs. Most employees working in the new facilities have a third-level education, while others qualified with in-house training upfront. In addition, Eli Lilly is expecting to spend ca. 0.5 million annually on training the new workforce. Altogether, and compared to other investment projects in other sectors, this is a very high level of expenditure in training.

[68] According to Teva's website, "a new complex for the production of solid dosage forms with an annual production capacity of 7 billion tablets and hard gelatin capsules had been built on the current company grounds in Opava-Komarov. The new plant was put into operation at the beginning of 2010."

[69] Another reason to this was increasing labour costs in India due to shortage of skilled workforce.

[70] Van Egeraat and Barry (2009) stress this dimension. For instance, according to the authors "Bio-fermentation is a frontier technology that typically involves relatively highly skilled personnel".

2.4.2 Indirect effect on jobs and additional demand in the regions

It is clear that not all the value created by the pharmaceutical sector is added in Ireland. Combined with limited purchases from Ireland, the impressive and increasing trade surplus in the sector (Ireland is the world's largest net exporter) mainly originates from payment to the overseas parent companies. Moreover, there are also indications that transfer pricing might be a well-developed practice, inflating the value added created by employees[71].

However, the sample of projects shows that investments have been beneficial in terms of their impacts on the region of the investment. In the case of Eli Lilly, the interviewees provided precise information on the potential impact of the project in terms of its impacts on the region of the investment.

Indirect effect of the investment phase

During the investment phase, the company's purchases of supplementary items within a 50 km radius of the site accounted for around 25% of their eligible investment sum. As, Eli Lilly's eligible investment sum amounts to €400 million, this means that about €100 m were spent in the region because of the investment.

Eli Lilly believes that around 280 indirect jobs have been created as a result of the investment within a 50 km radius. When asked about other impacts on the region during the investment phase, the interviewees pointed out that construction was going on on-site continuously for three to four years. During this time local vendors were sourced for various services and goods, such as cleaning activities or other auxiliary services. The company is working both with new and existing suppliers.

Indirect effect of the operating phase

Eli Lilly is the largest employer within a 30 km radius and states that it looks for opportunities to use the local workforce. As already mentioned, of the 140 new hires as of June 2012,[72] only up to 5% were brought to the region as expatriates by the company and more than 80% live within a 50 km radius of the site.

The target for additional turnover once the product being developed in the facilities reaches the market is €1 billion. The budget of the facilities amounts to around €55-60 million annually (incl. depreciation). The facilities only serve research and development and have been developing remarkably well according to representatives of Eli Lilly.

In terms of the effect of the investments on the *supplier base*, Eli Lilly estimates that 14% of the expected €1 billion of additional turnover resulting from the investment will be spent with suppliers located within a 50 km radius. In absolute terms, this represents a significant amount. However, this also reflects the limited extent to which the pharmaceutical industry generally purchases locally. According to Forfás (Ireland's policy advisory board for enterprise, trade, science, technology and innovation), only 6.4% of the €7.6 billion of materials purchased in 2009 by chemical companies in Ireland came from Irish suppliers; 10.6% of the €12.3 billion of services[73] purchases in 2009 came from Irish suppliers. The value of materials purchased in Ireland was stable between 2000 and 2009, while the value of services increased by 50%. However, the relative share of materials and services purchased in Ireland has been decreasing in terms of overall value[74].

Nonetheless, a representative of the IDA local office in the Irish Republic pointed out that the regional impact of investments from the pharmaceutical sector is more forceful than in any other industries, due to a stronger spill-over effect. For instance, the companies build relationships with colleges who adapt their curriculum to the industry's needs. According to the representative of

[71] Van Egeraat and Barry (2009).

[72] This number corresponds to the number of jobs at the time of a second interview in May 2012; hence the discrepancy with the data in the table above.

[73] The most expensive input into the production of a pharmaceutical product is the cost of the patent.

[74] Forfás(2009). Annual Business Survey Of Economic Impact 2009.

the IDA, a whole "eco-system" develops around the R&D facilities of pharmaceutical companies. Thus, investments give rise to spill-over effects, as described in section 2.4.3 below.

Moreover, the beneficiaries stressed that their investments helped facilitate the pathways for others and leveraged the broader area. Other companies are emulating the new technologies and invest in broadening their knowledge on specific construction works and engineering skills that are required to satisfy the demand induced by the new investments. In this regard, Eli Lilly estimates that ca. 200 indirect jobs were created by the investment locally.

Effects have not occurred yet nor are expected to occur in the *client base* within the region, since the products will be sold on a global market.

2.4.3 Other effects

In addition to the direct and indirect effects of the project on the economy set out above, the following positive effects of the investments can also be mentioned:

R&D activities and cooperation with higher education institutions
Three projects have made possible an increase in and/or support for research capabilities and activities: SmithKline Beecham, Teva and Eli Lilly. As is illustrated by the Teva and GlaxoSmithKline Dungarvan (see also above), it is increasingly difficult for Irish firms to compete with sites located in countries offering lower labour costs, especially when large-scale manufacturing of small molecules or generic drugs is the case. Hence, the main competitive advantage for Ireland in the future is its reputation as a centre for innovation and excellence. This calls for investing in R&D (including process R&D) and also requires companies to invest increasingly in linking their industrial activities with academic research.

In most projects, it has been possible to observe an increase in R&D activities, and strengthened or continued cooperation with higher education institutions. For example, Eli Lilly is intending to spend€55-60 million on R&D annually in connection with its new biotech facilities. Another example is SmithKline Beecham, which cooperates with the Technological Institute of the University of Cork and University College Dublin.

In this regard, interviewees stated that support for R&D is extremely important. They often referred to tax reductions for R&D activities as being one of the most influential instruments for supporting pharmaceutical industry operations in Ireland. (The government has had an R&D Tax Credit scheme in place since 2004.).

Spill-over and clustering effects
With 40 years of experience in the manufacturing of pharmaceuticals, Ireland has developed a world-class cluster, which has only a few competitors in the world outside Europe (mainly Puerto Rico and Singapore). Ireland has secured a solid position in the worldwide pharmaceutical sector and benefits from a strong spill over effect generated in the 70's thanks to a deliberate policy based on a highly educated workforce and a business friendly environment, boosted by the availability of EU structural funds. As mentioned above, however, constant efforts are needed to secure investments and jobs as global competition is increasing.

The Irish authorities still support large capital projects in order to anchor activities and jobs in Ireland. They also support the development of capacities in R&D and biotech. As said described above, the Irish granting authority pointed out that investment in the pharmaceutical sector generate stronger spill-over effect than in any other sectors, and particularly around the R&D facilities of pharmaceutical companies. As has been described, the projects analysed – even if not always fully carried out – have been said to contribute to sustaining this spill-over effect in the Irish pharmaceutical sector through high-value activities.

In terms of economic geography, the IDA acknowledges that Cork as a region has secured a strong position in the pharmaceutical industry and continues to benefit strong spill-over effect. This is also well mirrored by the projects analysed, a majority of which are located in County Cork. In Waterford, the industrial base is weaker in spite of higher aid made available to

companies that invest in the less developed regions (including Waterford, where the level of aid potentially available is higher than in Cork). The IDA acknowledges that it is difficult to influence location decisions in favour of peripheral regions, especially when looking for investments in biotech. Since 2009 and under the Regional Aid Guidelines, the South West (Counties Cork and Kerry) have no longer been eligible for regional aid; the South East (including Country Waterford) remains eligible, up to 10% GGE.

Lasting commitment of the companies

In all four of the projects that have been (partly) implemented or are still on-going, it is possible to argue that the investment has secured the activities of the facility over the medium or longer terms. This is the result of a combination of increased productivity and competitiveness, and higher-value jobs. This enables the Irish pharmaceutical plants to respond to strong worldwide competition. Against this background, the project sample also indicates that in the pharmaceutical sector, fixed capital investments do not guarantee the sustainability of jobs and activities: the Amgen and Pfizer projects were cancelled despite the fact that building work had started and Ivax closed down the solid products business in Waterford only a few months after the investment was completed.

2.5 Impact on competition

This section will analyse the potential impacts that the projects considered in the case study may have on the overall level of competition in their respective markets. To do so, the potential excesses in the market power of each firm as well as the inefficiencies of the market structure itself are screened: the former, by considering the market share of each company and the barriers to entry in the market; the latter, by assessing the conditions of the market and the potential situation of overcapacity. The considerations are then summarized in order to understand the potential negative effects on the competitors, mainly in terms of crowding out effect.

2.5.1 Potential distortion due to excessive market power

Market shares

In 2010, the five largest companies, namely Pfizer, Novartis, Merck&Co, Sanofi-Aventis and Astrazeneca, had a combined market share worldwide of more than 25%.[75]

The Hirshman-Herfindahl-Index (HHI)[76] for the European pharmaceutical market ranges from 915 (if we consider the market for NCEs and generics as one market) to 1221 (if we only consider the market for NCEs). These HHIs indicate that the pharmaceutical market can be considered moderately concentrated. This is also the case at a global level[77].

There are no available data for the level of concentration in the generics market. Nevertheless, it one may assume, on top of the information reported in the introductory session of this case, that the competitors are mostly SMEs in Europe and in the USA or large, growing companies in the "pharmamerging" markets. Thus, the level of competition is probably higher, also due to the absence of the patent-related distortive effects.

[75] IMS Health(2012). Top-line market data. Available at: http://www.imshealth.com/portal/site/ims/menuitem.5ad1c081663fdf9b41d84b903208c22a/?vgnextoid=fbc65890d33ee210VgnVCM10000071812ca2RCRD&vgnextfmt=default

[76] This is a measure of the size of firms in relation to the size of the whole industry and an indicator of the amount of competition among them. The index is equal the sum of squares of market shares. The index ranges from less than 100 (approaching 0 in case of perfect competition) to 10,000 (in case of a monopoly).

[77] Ecorys (2009). "Competitiveness of the EU Market and Industry for Pharmaceuticals. Volume II: Markets, Innovation & Regulation". Final Report. Available at: http://ec.europa.eu/enterprise/sectors/healthcare/files/docs/vol_2_markets_innovation_regulation_en.pdf

Barriers to entry

The barriers to entry are extremely high in the pharmaceutical industry. Many of the top firms have significant manufacturing capabilities that are hard to replicate. Hence, the overall threat of entry into the global marketplace is relatively low in comparison to other international industries due to:

- economies of scale - manufacturing, R&D, marketing, sales
- distribution product differentiation - established products, brands and relationships
- capital requirements and financial resources
- access to distribution channels: preferred arrangements
- regulatory policy: patents, regulatory standards
- switching costs - employee retraining, new equipment, technical assistance[78]

The largest factors that influence the success of many pharmaceutical companies are capital requirements and financial resources, regulatory policies, and research and development[79]. The restructuring process Big Pharma is currently undergoing is concentrated on R&D structures and strategies reshaping, clearly demonstrating how these key factors are interlinked.

Even in the case of the Generics where, as illustrated in the introductory section, the R&D and patenting issues are not relevant, barriers to entry remain high. Especially, from the point of view of the access to economies of scale, existing technology and preferred marketing channels. However, according to the European Generics Association, patent litigation processes are still hindering the fullest development of the generics market[80].

2.5.2 Potential distortions due to market inefficiencies

Market conditions

As it is stated in the introductory section, the pharmaceutical market is highly globalised and dominated by few companies, operating in all the main regions. For this reason, the market definition is global and has to take into account the different paces at which the different regional blocks grow. For instance, In 2011 the Brazilian and Chinese markets grew by more than 20% (20.0% and 21.9% respectively) compared with an average market growth of 2.6% for the five major European markets (France, Germany, Italy, Spain and the UK) and 3.6% for the US market[81]. The generics market, that as illustrated in the introductory sessions, is likely to grow at a global CAGR of 9,7% between 2011 and 2016[82] and in Europe at a CAGR of 8,4%[83], thus outpacing the patented pharmaceutical market.

[78] Retrieved from: Duke University (2007). "Social and Environmental Factors: The Growing Emergence of Global Standards". Available at: http://www.duke.edu/web/soc142/team2/social.html#barriers

[79] Ibidem.

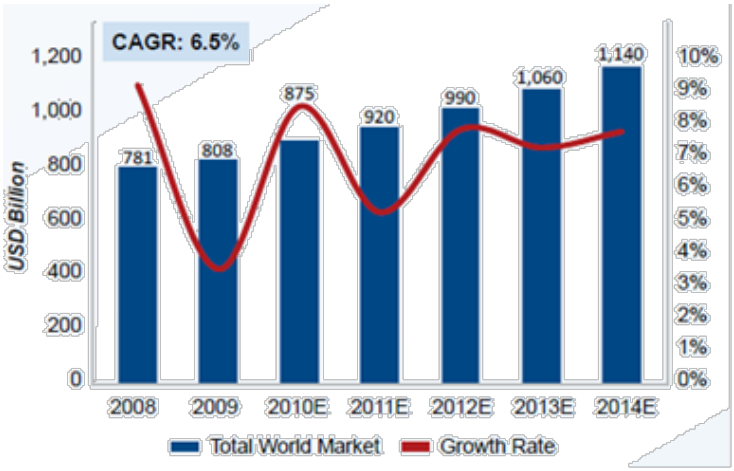
[80] European Generics Association (2008). "Patent-related Barriers to Market Entry for Generic Medicines in the European Union; A review of weaknesses in the current European patent system and their impact on market access of generic medicines". Available at: http://www.marcasepatentes.pt/files/collections/pt_PT/1/178/EGA%20Report%20IP%20Barriers%20Generic%20Medicines.pdf

[81] Retrieved from: EFPIA (2012). The Pharmaceutical Industry in Figures. Available at: http://www.efpia.eu/sites/www.efpia.eu/files/EFPIA%20Figures%202012%20Final.pdf

[82] BBC Research (2010). " Generic Drugs: The Global Market--Focus on Europe". Available at: http://www.bccresearch.com/report/european-generic-drugs-phm107a.html

[83] Ibidem.

Figure 9: Global pharmaceutical market trend estimate[84]



Market growth in the EEA is lower than in other markets, but still stronger than the overall GDP growth and the outstanding growth rates in the emerging market as well as the substantially satisfying growth pace in the US, help keeping the global demand high. Hence, relative decline or even absolute decline of the market is not a matter of concern in the case study.

Overcapacity

Likewise, these growing trends and the overall healthiness of the pharmaceutical market allow us to exclude the risk of potential overcapacity as sound.

2.5.3 Effects of aid for competitors

Overall, the level of market concentration globally and in Europe is moderate. Moreover, the growing importance of the generics sector, with the pressure it exerts on prices and margins of the established pharmaceutical producers, is helping to reshape the market. Barriers to entry in the sector remain high, even for the players interested in the generics market. This is in line with the capital intensive nature of the industry.

Here again, the growing importance of generics helps in reducing entry barriers eliminating R&D costs and limiting the distortive effects connected to the patenting regime. Given the dimensions of the industry and of the players concerned, we can conclude that it is unlikely that the aided investments could have had any significant impact on market concentration level nor could it help to raise market power of incumbents.

Potential distortive effects related to overcapacity or declining market situation are not likely to occur due to the positive growth rates scored by both the patented and generics pharmaceutical markets.

Finally, it should be noted that: in this particular case, the nominal value and intensity of the aid are moderate, compared with the size of the companies considered on the one hand, and the general level of aid observed across industry case studies on the other hand. Beyond this, only one of the case studies examined progressed to completion and received aid in the end.

Although this could not be confirmed by interviews with competitors[85], it is possible to conclude that there is no distortive effect of the aid as such in this particular case study, because of the conditions of the market, the peculiarity of the industry, and the aid amounts awarded and finally paid.

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[84] IMAP (2011). "Pharmaceutical and Biotech Industry Global Report 2011". Available at: http://www.imap.com/imap/media/resources/IMAP_PharmaReport_8_272B8752E0FB3.pdf, p.3

[85] To assess potential impact on competition, nine leading manufacturers worldwide were approached. Two companies specifically declined to be interviewed and seven did not respond to our inquiry.

2.6 Conclusion

The context for consideration of this case study is that the government of the Republic of Ireland has been committed to developing a global presence in pharmaceuticals for a number of decades. Built upon a corporation tax level that is one of the lowest in the European Union, the package of incentives that they have used have included grant investment, tax breaks and access to EU Structural Funds. Within such a context the following conclusions can be drawn from the projects analysed in the pharmaceutical sector in Ireland:

Determinants of investment or location decisions of the aided firms
According to the evidence collected, there were no cases where the aid led to additional investment. Investment was part of the companies' response strategy to growing demand and technological opportunities. In this context, state aid was not a central driver of investment. This finding is further supported by the fact that some investments were not at all or only partially carried out even though this meant losing the whole benefit of the aid, because of IDA rules on not paying aid amounts pro rata. This means that the aid had no lock-in effect on the investments.

When looking at the decision to invest in Ireland, the country often competed with other locations, especially outside Europe (e.g. Singapore or Puerto Rico), and aid was part of an overall and complex competitive package that was assessed against financial and more qualitative criteria. The importance of the aid as part of this package cannot be isolated, but in no case did the beneficiaries deem that their investment project would have been carried out elsewhere if no aid had been offered. Location factors that are more important than the aid included pre-existing operations, the availability of skilled labour force and more generally the presence of a leading cluster in pharmaceuticals. Nevertheless, state aid is acknowledged to constitute a positive signal that is valued by local management in Ireland, especially when they have to convince the board of their parent company that they should invest in their operations in Ireland rather than anywhere else in the world. In that case, investment aid can only strengthen their bargaining position.

When looking at the decision to invest in a specific region in Ireland, and in spite of higher aid amounts offered in less favoured regions, the project sample does not exhibit any incentive effect from regional aid. IDA Ireland acknowledges that it is difficult to influence location decisions in favour of peripheral regions, especially when looking for investments in biotech, due to strong agglomeration economies in the sector[86].

Consequences of the investments in terms of regional and employment benefits and externalities
Despite concerns that only a limited proportion of the value created by the pharmaceutical sector is added in Ireland, the sample of projects provides indications that the investments are beneficial to Ireland and its regions. Direct jobs have been created or safeguarded in the regions where investments occurred, and the value of the jobs increased. Moreover, investments benefit the regional economies through local spill over effects in particular and through the increases in demand induced by the fact that the majority of the new labour force is employed locally.

Overall, state aid had a limited influence on the investors' decisions, but the average aid intensity granted to the pharmaceutical industry was the lowest of all case studies, and much lower than what the RAG would permit. In addition, the aid was not paid if the (non re-negotiable) objectives of the grant agreement was not met. Finally, financial assistance is used by the IDA as an important part of a broader mix of incentives, subsidies and support as well as an opportunity to maintain continuous dialogues with potential investors in the industry. This means that, in spite of limited incentive effect of the aid in the investment and location decision as such, sufficiently high added value for money was ensured from a tax payer perspective.

[86] The fact that Cork, which as an eligible region in at the time of the decisions, attracted many investment projects related more to the existing plants and, more generally, the high concentration of pharmaceutical firms in the region.

The distortive effects of aid for competitors and/or other regions

There were no negative impacts to be observed on competition. The conditions of the market in terms of market power of the beneficiaries and the overall efficiency of the market structures are not a matter of concern. In addition, IDA is also careful in allocating the lowest level of aid possible. In the project sample, regional aid has had a limited incentive effect on firms' investment decisions, and there are no instances where competitors reacted to the aid allocated by the IDA.

3. SOLAR INDUSTRY – GERMANY

This second case study looks at the solar industry in Germany. It is based upon three investment projects.

3.1 Background

This chapter introduces the development in the solar industry worldwide. The megatrends on demand and supply are illustrated to better clarify the dynamic nature of this industry, its impact on the global economy as well as the changes it underwent after the 2008 economic downturn. The analysis starts with the global perspective to then focus on the European market and then on German one. This will help to illustrate the context in which the investment projects were developed.

3.1.1 Introduction to the solar sector

Growing demand for solar electric energy is a global phenomenon. Since the 90s demand at global level has grown by an average of 30% per annum. According to the European Photovoltaic Industry Association (EPIA), solar photovoltaic (PV) electricity generation has continued to grow even during the recent financial and economic crisis. The worldwide installed capacity at the end of 2010 was 40 GW, i.e. 0.1% of worldwide electricity generation. Gartner[87] expects annual growth in demand of 24% to 2013. The value of the market in terms of revenue will be lower due to technological advances and cost savings, but is still expected to grow by 17% annually from 2008 to 2013 to reach $34 billion annual revenue in 2013[88]. Future growth is expected mainly from Asia and the US[89]. In absolute terms, however, PV electricity generation is still very much a niche market.

The global demand of PV products is still mainly driven by five countries with Germany accounting for a third to half of the world market between 2008-2010. Spain has been replaced by Italy as the second largest market. Overall, Europe is the largest market for PV products. In 2011, 21.9 GW of PV energy were connected to the European grid. PV energy now makes up 2% of demand in the EU and is the third most important renewable energy source after hydro and wind power[90].

The development of the solar industry has benefited from strong governmental support. A large variety of incentive schemes were deployed globally, including within the EU. This has led to concerns about possible dumping policies[91] with the European Commission recently launching an anti-dumping investigation into imports of solar panels and their key components (i.e. solar cells

[87] Gartner is an information technology research and advisory company that delivered a report in 2012 on the expect trends in the PV market worldwide. More information available at: http://www.gartner.com/technology/home.jsp

[88] PV Tech (2009). "Gartner posts long-range forecast for photovoltaics industry". Available at: http://www.pv-tech.org/news/gartner_posts_long_range_forecast_for_photovoltaics_industry

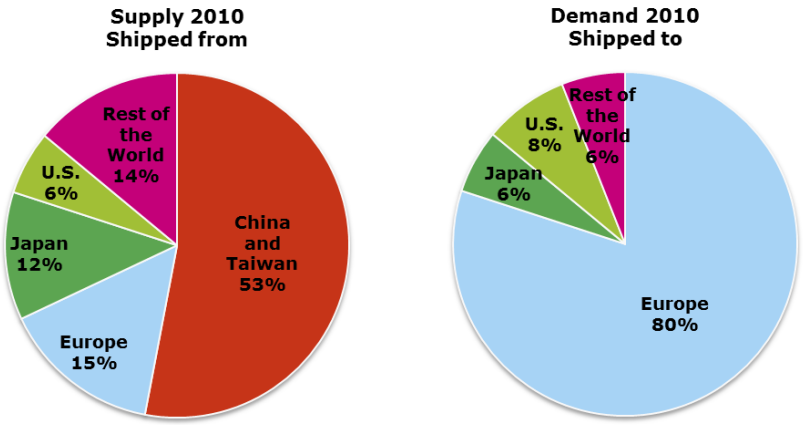
[89] European Photovoltaic Industry Association (2012). "Solar Power at the Crossroads: Photovoltaic markets saw record growth in 2011, but industry faces short-term challenges".

[90] Ibidem.

[91] Der Spiegel (2011). "The Sun Rises in the East. German Solar Firms Eclipsed by Chinese Rivals". Available at: http://www.spiegel.de/international/business/0,1518,784653,00.html (12.02.2012).

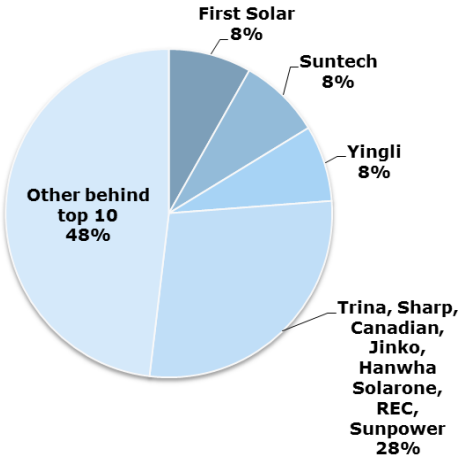
and solar wafers) originating from China. EU Pro Sun, an industry association, claimed in its complaint lodged on 25 July 2012, that solar panels and their key components imported from China enter the European market at prices below market value[92].

Figure 10: Global PV supply and demand by world regions in 2010[93]



This is relevant, because, as shown in the chart above, China and Taiwan are the largest suppliers of solar panels. The five largest Chinese solar module companies almost doubled their total market share in two and a half years (from Q1 2009 to Q2 2011)[94] , accounting now for nearly one-third of the worldwide solar modules market.

Figure 11: Market shares of top 10 solar module companies in 2011[95]



However, if we consider the whole value chain of the product, from the raw materials to the connection to the grid, figures show a much more varied situation compared to that of Chinese dominance described above, especially if we take into account the provision of services to the final customers in local markets (for instance installation). As shown in Figure 12 below, the cost

[92] European Commission, DG Trade (2012). "EU initiates anti-dumping investigation on solar panel imports from China". Available at: http://trade.ec.europa.eu/doclib/press/index.cfm?id=829

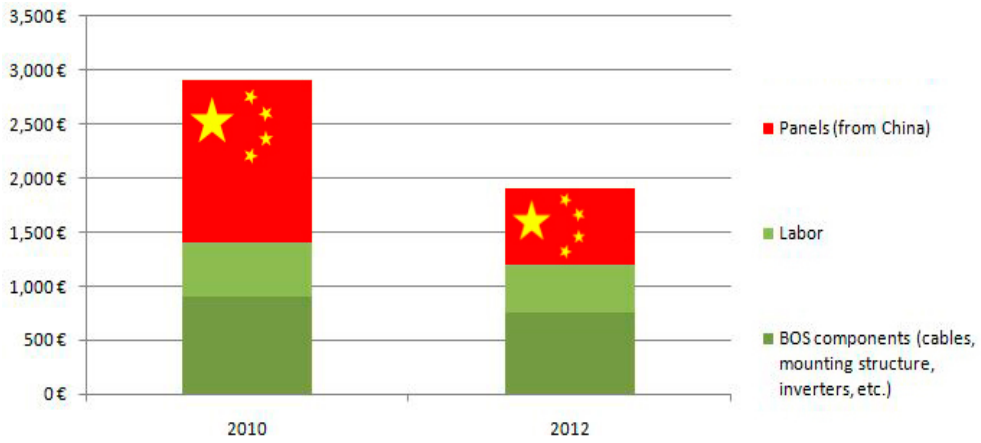
[93] Graph based on data retrieved from: Sunshot US Department of Energy (2012), "Sunshot Vision Study", Available at: http://www1.eere.energy.gov/solar/sunshot/vision_study.html. Based on data from: Mints, P. (2011a), "Photovoltaic Manufacturer Shipments, Capacity & Competitive Analysis 2010/2011", Palo Alto, CA: Navigant Consulting Photovoltaic Service Program, Report NPS-Supply6 (April 2011); and Mints, P. (2011b), "Analysis of Worldwide Markets For Solar Products & Five-Year Application Forecast 2010/2011", Palo Alto, CA: Navigant Consulting Photovoltaic Service Program, Report NPS-Global6 (August 2011)

[94] PV Insight Report (2011). "Suntech lost championship of solar module shipment to First Solar in 2Q11". Available at: http://pvinsights.com/Report/ReportPMM31A.php

[95] Graph based on data retrieved from: Ibidem

of the module accounts for only a part of the final output, due to the costs of services and the so-called balance-of-system (BOS) components, the electronic equipment needed to connect the module to the grid.

Figure 12: German vs. Chinese price components of a solar rooftop system[96]



On this basis, Germany is not only the largest market for Chinese solar modules, but also the largest provider of BOS components and solar related services.

3.1.2 The solar sector in Europe

Europe has developed from an annual market of less than 1 GW in 2003 to a market of over 13 GW in 2010 and 21.9 GW in 2011. Europe's market development is the result of a few countries that have taken the lead year after year, with Germany showing a constant commitment from policymakers to support the development of PV[97]. The other major countries to support those kinds of policies, on a less regular base, were Italy, Spain and the Czech Republic. The latter proved problematic cases because of a rapid overheating of the market due to unbalanced policies to facilitate the development of the PV market there, for instance:

Spain

Policies implemented by the Spanish government fostered the growth of the PV market through 2008, with output growing from 35 MW in 2005 to 110 MW in 2006, securing Spain the second position among European PV markets. Spain topped the European market for new installations in 2008. After its record-breaking year in 2008, the Spanish government placed a cap on new PV installations, which caused the PV market in Spain to plummet to an estimated 70 MW of new installations in 2009. At the end of January 2011, the government also decided to reduce the number of hours during which the solar module facilities can be operated over the next two years by 30%[98].

After the Spanish boom in 2008, Germany was the only leading market in 2009, and consequently European growth as a whole was limited. Major growth returned in 2010, with Germany scoring unprecedented installation numbers, and Italy and Czech Republic adding together close to 4 GW of PV systems

The Czech Republic

Since 2009 the Czech Republic has grown to be a leader in Europe for the use of PV energy. The country has been fueled by foreign investments from the Solar Industry, creating a solar boom comparable to that in Spain in 2008[99]. Foreign capital was attracted by generous tariff schemes and it brought to the installation of rooftops-size plants as well as larger scale on-ground

[96] Heinrich Boell Stiftung (2011). "The German Solar Bubble". Available at: http://www.boell.org/downloads/Morris_GermanSolarBubble.pdf

[97] EPIA (2012). " Global Marke Outlook for Photovoltaics until 2016". Available at: http://files.epia.org/files/Global-Market-Outlook-2016.pdf

[98] Nixon Peabody (2011). "Photovoltaics, a brief European survey". Available at: http://www.nixonpeabody.com/118648

[99] Ibidem.

plants[100]. As a result, the output of its newly installed PV plants was the third highest in the European Union in 2010 and topped 1,000 MW.

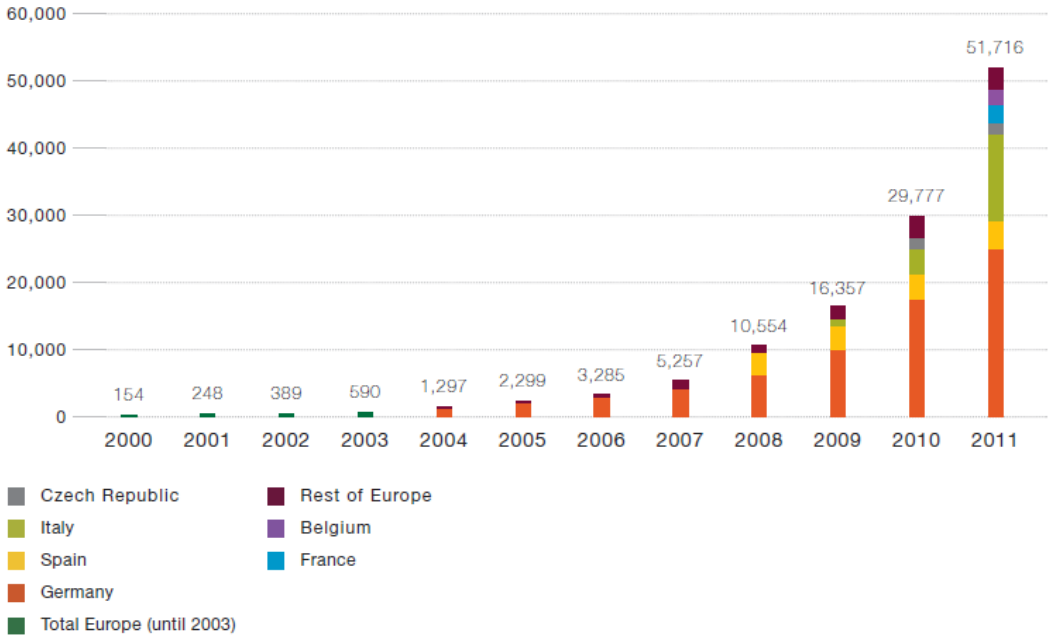
However, the Czech Republic's government undertook measures to drastically reduce the number of new PV plant installations in 2011. The government cut more than 50% of the feed-in tariff for solar power plants with an output of over 100 kilowatts, imposed a 26% tax on PV energy from PV plants with an output of over 30 KW production for the next three years as well as 32% tax on carbon credits awarded to solar companies in the next two years, and implemented higher fees for the use of farmland for building PV plants[101].

Italy and other countries

In 2011, the combined boom of Italy's connections and Germany's installations led again to huge growth, even with the bubble bursting in Czech Republic. In Italy, the government's strong support of the PV industry through feed-in-tariffs contributed to rapid growth in the PV sector, particularly in the residential field, with incentives to link up to local grids and become power suppliers. However, the incentives for new installations were cancelled in early 2011. The market kept growing sharply in 2011 and the impact of this withdrawal will be clear only with the final data of 2012. For what new possible markets are concerned, France's growth in 2011 was at least partly due to the high number of connections to the grid in 2010[102]. These were due to a series of subsidies that include:

- a requirement that Electricité de France (EDF) buy solar-produced energy at a rate that varies from € 0.31 to € 0.58 per kWh instead of the market rate of € 0.11,
- income-tax credits for the installation of renewable energy sources,
- direct subsidies for the installation of solar panels, and
- 50% income-tax credits on labour wages during the installation of renewable energy materials. These incentives are designed to achieve grid parity, the point at which alternative energy production costs and market energy prices will be equal, artificially[103].

Figure 13: European installed capacity 2000-2011[104]



[100] Duralux (2011). "Czech Photovoltaic Market increasingly going down". Available at: http://www.duraluxe.com/Html/NewsView.asp?ID=90&SortID=27

[101] Nixon Peabody (2011). "Photovoltaics, a brief European survey". Available at: http://www.nixonpeabody.com/118648

[102] EPIA (2012). "Global Market Outlook for Photovoltaics until 2016". Available at: http://www.epia.org

[103] Knowledge Wharton (2011). "Solar Power Incentives in France: Subsidization without 'Planification'?". Available at: http://knowledge.wharton.upenn.edu/article.cfm?articleid=2700

[104] EPIA (2012). "Global Market Outlook for Photovoltaics until 2016", p. 15. Available at: http://www.epia.org

3.1.3 The solar sector in Germany

The development of the solar industry in Germany is embedded within the German Federal Government's policy of structural change in the energy sector. Since the late 90s the Federal Government has strongly supported and subsidised the expansion of renewable energy to achieve a structural change in energy supply. The Federal Government considers the expansion of renewable energy as an instrument to bring about a fundamental modernisation of energy supply in Germany and to strengthen Germany's leading position on the global market for climate-friendly technologies. This strategy is reflected in the Government's goal of increasing the share of renewable energies in total gross electricity consumption to at least 30% by 2020[105].

Within this strategy the development of a national solar industry has been a policy priority. The first programme was initiated in 1989 with the "1,000 roofs programme". This was followed by a "100,000 roofs programme" in 1999.

A key cornerstone in the development of a solar industry has been the Renewable Energy Sources Act (EEG) implemented in 2000. Its aim was to create a mass market so that the scaling-up of production would decrease the costs for the users. The Renewable Energy Sources Act has been the most important market driver and is considered by the German Government to have been the most successful instrument for the expansion of renewable energies, especially in relation to the establishment and development of the country's solar industry. The EEG obliges grid operators to give priority to the purchase of electricity from renewable energies at a fixed cost. As this applies for PV systems, the EEG has provided a high degree of planning and investment security due to fixed tariffs over a period of 20 years. With the platform of the EEG, the German Government has created the largest subsidised demand-driven market for renewable energy sources worldwide.[106]

The German government's energy policy measures have created a strong solar industry in Germany. The industry is mainly located in Eastern Germany, in the so-called "Solar Valley". This refers to a solar industry cluster in Thuringia, Saxony and Saxony-Anhalt with a very high density of PV activities. The valley accounts for 65% of German production capacity and 14.5% of worldwide cell production. The region offers several structural advantages for investments, which, according to the Investment and Marketing Corporation of Saxony-Anhalt, include: [107]

- Lowest unit labour costs based on gross value added (GVA) compared with the US, Japan, South Korea and the German average;
- Access to first-class transport infrastructure (road density is twice as high as the EU average);
- Proximity to the world's biggest market for PV products;
- Lower corporation tax than in France, Belgium, Italy, Spain or the United Kingdom[108];
- High awareness of intellectual property protection;
- High availability of well-skilled labour force[109];

The majority of the German solar industry is located in Eastern Germany. As a matter of fact, about 60% of all jobs in the German solar industry are located in Eastern Germany. It is one of the few strong industries that has established in this area since the German reunification in 1990[110]. A pre-condition for this rise was the existence of a semiconductor industry in the former GDR. The technology used by this industry is similar to the technology used by the solar industry.

[105] German Renewable Energies Agency (2012). "The German Renewable Energy Sources Act - a story of success". Available at: http://www.unendlich-viel-energie.de/en/policy/the-renewable-sources-act.html

[106] German Ministry for the Environment, Nature Conservation and Nuclear Safety (2012). "Die von Ihnen gewählte Seite gibt es nicht, ist nicht mehr erreichbar oder es besteht keine Zugangsberechtigung". Available at: http://www.bmu.de/english/renewable_energy/general_information/doc/4306.php and http://www.erneuerbare-energien.de/inhalt/42720/ (12.02.2012).

[107] Investment and Marketing Corporation of Saxony-Anhalt (2011). "Welcome to Solar Valley".

[108] On average, the tax rates on earnings paid by incorporated companies in the Saxony-Anhalt amounted to ca. 27% (30% in Germany), i.e. one point below the UK and more than seven points below France. Source: Ibid.

[109] Share of third level graduates in Saxony 32%, Thuringia 28% and Saxony-Anhalt 25% (EU-27 average: 26%). Source: Eurostat data 2010. Persons aged 25-64 with tertiary education, attainment by sex and NUTS 2 level.

[110] Institut für Wirtschaftsforschung Halle (2011). "Wirtschaftlicher Stand und Perspektiven für Ostdeutschland", p. 72.

After reunification the Eastern German semiconductor industry collapsed, as it was not competitive any more. The rising solar industry offered new employment opportunities for skilled engineers from this industry. Furthermore, low labour costs and extensive subsidies supported the process of establishing a solar industry in Eastern Germany. While knowledge and capital often came from Western Germany, manufacturing sites were mainly located in Eastern Germany.

As demand for solar modules has grown the associated high fixed tariffs for solar energy granted by the EEG have contributed to increased domestic electricity prices. Since 2010, the German Federal Government has reacted to this development by sharply reducing levels of subsidy, especially for the solar industry: After a record number of new solar modules installed in 2011, the German Federal Government decided to decrease the fixed tariffs for solar energy by up to 30% in March 2012.

According to the German Solar Industry Association (Bundesverband Solarwirtschaft) the government's policy facilitated the development of a modern industry. Over 200 companies produce PV components at all stages of the production chain. This number rises to 10,000 companies if suppliers and the trade and craft industry are taken into account. The PV industry has a workforce of around 130,000 employees in Germany (including suppliers), achieving an added value in Germany of around €10 billion in 2010[111]. In 2010, about half of the 16 GW of solar modules newly installed across the world were installed in Germany. Although the German market still maintains its importance, the significance of export markets has grown continually, rising from 14% in 2004 to 55% in 2011. For years German solar companies like Q-Cells, Conergy and Solon have held top positions on the international stage in terms of technology[112].

Developments in the solar technology market have proven to be highly dynamic and have become challenging for German solar companies. The solar industry in Germany is now in a process of consolidation. Many German solar companies are currently suffering because at a time of growing demand, solar module prices have fallen sharply due to overcapacity in the sector, falling by around 56% since 2006. This has implied significant losses, job cuts and the threat of bankruptcies.[113] For instance, many of the leading companies cited above underwent critical developments, despite the governmental support received by sector. Q-Cells, that received aid of around €200 million over the last seven years, had to cut 500 jobs in Bitterfeld-Wolfen in 2009 and in early 2012 it had to declare bankruptcy and almost all the assets were bought by the South Korean firm Hanwha Group in August[114]. Conergy shut down its production site in Frankfurt-Oder. Originally, the company planned to create 1,000 new jobs by mid-2008, but in fact at a peak only created 700 jobs. The Hamburg-based company received aid of €76 million between 2006 and 2009. Solarworld, Germany's largest PV manufacturer, stated that it would close down older production sites. Solarworld received aid for three different projects near Chemnitz of around €73 million in 2003, €45 million in 2010 and €19 million in 2011.

As shown in the following sections, the drivers of the investment decisions of the project sample reflect these broader market developments (note that the companies considered in the selected projects are different than those mentioned above). The investment projects were triggered by the rapidly growing demand for PV products and the positive forecasts on its expansion over the period 2006-2020[115]. Today, however, the companies are challenged by Asian competitors and suffer from overcapacity in the global and German solar markets.

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[111] German solar Industry Association (2012). "Statistic data on the German solar power (photovoltaic) industry". Available at: http://www.photovoltaique.info/IMG/pdf/factsheet_pv_engl.pdf

[112] Bundesverband Solarwirtschaft (2012). Marktdaten. Available at: http://www.solarwirtschaft.de/presse-mediathek/marktdaten/ (12.02.2012).

[113] Klooß, K. (2001), "Deutsche Solarförderung - Das Ende der Nachhaltigkeit". Manager Magazin. Available at: www.manager-magazin.de/unternehmen/energie/0,2828,785680,00.html

[114] Renewable Energy World (2012). " Q-Cells and Hanwha: Solar Geopolitics Gets Messy". Available at: http://www.renewableenergyworld.com/rea/news/article/2012/08/q-cells-and-hanwha-the-messy-geopolitics-of-solar

[115] Referat Westliche Industrielaender (2006). "Solar Industry in Germany". Available at: http://library.fes.de/pdf-files/bueros/london/03560.pdf

3.2 Selected sample of investment projects

3.2.1 Overview of projects

This case study is based on a sample of three investment projects.

Table 8: Projects in the case study on the solar industry in Germany[116]

Beneficiary	Region	Instrument	Aid amount (m€, nominal)	Max. aid intensity allowed (GGE)	Aid intensity awarded (GGE)
Ersol Solar Energy	Erfurt, Kreisfreie Stadt	Tax allowance	55.1	10.2%	10.2%
Masdar PV	Erfurt, Kreisfreie Stadt	Direct grant Tax allowance	28.6	19.3%	19.3%
Wacker Chemie	Meißen	Direct grant Tax allowance	97.5	12.3%	11.7%

Max. aid intensity allowed: Maximum aid intensity permitted by the RAG
GGE: Gross Grant Equivalent

Ersol Solar Energy AG: Ersol produces solar modules in a vertically integrated scheme (from the production of polysilicon to the module itself). The company was founded in 2001 and has its headquarters in Erfurt, Germany. In 2008, the Ersol group was purchased by Robert Bosch GmbH, an international technology group whose main activities are automotive technology, industrial technology, consumer goods and building technology. The solar energy business segment in Bosch is concentrated in Ersol. Although the firm is commonly listed as being an important producer, it is not considered to be a global leader nor does it have a market share comparable to that of the Chinese suppliers[117].

The Ersol investment project involved extending the existing facilities for the production of solar ingots, wafers and cells and setting up a new solar module plant in Arnstadt. The total investment costs of the project amounted to €526 million (nominal value). The investment project started in July 2007. It was planned to be completed by the end 2012 and full production was expected to be reached by 2013. Ersol intended to create around 689 new direct jobs and a minimum of 500 new indirect jobs in the region. According to the beneficiary the investment project had created around 1,000 new direct jobs by 2012.

The aid to Ersol was granted by the Thüringer Aufbaubank (Thuringian Development Bank). The aid amounted to a nominal value of €55.1 million and took the form of a tax allowance. The notified aid is based on two existing block exempted regional aid schemes: the "Investitionszulagengesetz 2007" and the "Investitionszulagengesetz 2010"[118].

Masdar PV GmbH: Masdar produces thin-film modules. The company was established in 2008 and is headquartered in Erfurt, Germany. Masdar is owned by the Abu Dhabi Future Energy Company and the Mubadala Development Company of the government of Abu Dhabi (United Arab Emirates). The latter is a holding company, with stakes in a range of diverse sectors, e.g. energy, real estate, raw material extraction and services. Masdar supplies the parent company with its thin-film modules in the framework of the Masdar initiative[119].

The investment project was to set up a new production plant to manufacture thin-film solar modules. Works began in 2008. The total investment costs of the project amounted to around

[116] European Commission, State Aid Register. Available at: http://ec.europa.eu/competition/state_aid/register/

[117] Green Rhino Energy (2012). Value Chain Activity: Manufacturing Crystalline Modules. Available at: http://www.greenrhinoenergy.com/solar/industry/ind_04_pv_modules.php

[118] In conformity with Article 8 of Commission Regulation (EC) No 1628/2006 of 24 October 2006 on the application of Articles 87 and 88 of the Treaty to national regional investment aid (Block Exemption Regulation for regional aid, OJ L 302, 1.11.2006, p. 29), the German authorities submitted summary information on these aid schemes registered under XR 6/2007 - Law on investment premiums 2007 and X 167/2008 - Law on investment premiums 2010.

[119] UAE Embassy (2009). "Featured stories: the Masdar Initiative". Available at: http://www.uae-embassy.org/uae/featured-stories/masdar-initiative

€143.5 million (nominal value). The plant started production in 2009. The investment has been fully operational since the end of 2010. According to the beneficiary the investment project created about 200 direct jobs in the region.

The aid was awarded by the Thüringer Aufbaubank (Thuringian Development Bank). The financial support of the German authorities amounted to a maximum nominal amount of €28 million and was awarded using two different aid instruments (a tax allowance and a direct grant). The tax allowance was awarded on the basis of the "Investitionszulagengesetz 2007" (Law on investment premiums 2007) and the direct grant was based on the "36. Rahmenplan der Gemeinschaftsaufgabe -Verbesserung der regionalen Wirtschaftsstruktur".

Wacker Chemie AG: Wacker Chemie produces polysilicon[120] and silicon wafers. The company was established in 1914 in Germany and is now a global chemical group. Wacker Chemie has been based in Nünchritz since 1998 and has become the second largest producer of polysilicon in the world and one of the fifth largest in the wafer market.

The investment project was to extend Wacker Chemie's site in Nünchritz by building a new plant produce solar grade polysilicon. The total investment costs of the project amounted to €800 million (nominal value). Works on the investment project began in October 2008. The works were completed in April 2012 and it is planned to reach full production by the end of 2012[121].

The aid was awarded by the Ministry of Economy and Labour of Saxony. The financial support of the German authorities amounted to a nominal amount of €97.5 million and was awarded using two different aid instruments: a direct grant and a tax allowance. The tax allowance was awarded on the basis of the "Investitionszulagengesetz 2007"and its successor scheme "Investitionszulagengesetz 2010". The direct grant was based on the "36. Rahmenplan der Gemeinschaftsaufgabe - Verbesserung der regionalen Wirtschaftsstruktur". As noted above, these schemes are covered by the General block exemption Regulation

3.2.2 Main characteristics of the projects

Types of investments

For Wacker Chemie and Ersol the investments were extensions of existing plants. The pre-existence of a production site was a major driver in the location decision of both companies. For Masdar, the investment was to build a new plant.

Types of expenditures

In all three cases the investment included the acquisition of production facilities and equipment.

In the case of Masdar and Ersol, the investments also included building new facilities for support functions such as maintenance or other auxiliary services. Both Masdar and Ersol built an R&D centre. Ersol also built an administrative centre for the company at the investment location.

Types of activities involved

The three companies are present on different steps in the value chain: Wacker Chemie produces polysilicon, the main raw material for the production of solar crystalline wafers, cells and modules. Ersol and Masdar are present on the market for the manufacturing of PV modules. However, Masdar invested in the thin-film technology, which is an alternative technology to crystaline modules, less polysilicon-consuming than other (older) technologies. According to the interviewees, there is a supplier-client relationship between Wacker and Ersol[122].

[120] Solar grade polysilicon is the main raw material for the production of solar crystalline wafers, cells and modules that are part of an integrated solar energy system and that convert sunlight into electricity.

[121] Chemicals technology. "Wacker Chemie polysilicon Production Plant, Nuenchritz, Saxony". Available at: http://www.chemicals-technology.com/projects/wacker-chemie-polysilicon-production-saxony/

[122] A graphical representation of the PV industry is provided by Green Rhino Energy (2012). Value Chain Segment and Activity. Available at: http://www.greenrhinoenergy.com/solar/industry/ind_valuechain.php

3.2.3 State aid scheme(s) and project selection

3.2.3.1 Presentation of the aid scheme(s)

As stated above, in all the three investment projects the aid was granted under existing schemes. Tax allowances were granted on the basis of the "Investitionszulagengesetz" (IZ scheme) and direct grants were granted on the basis of the "36. Rahmenplan der Gemeinschaftsaufgabe - Verbesserung der regionalen Wirtschaftsstruktur" (GA scheme). Both schemes are covered by the General block exemption Regulation[123].

All three beneficiaries received a tax allowance based on the IZ scheme. The scheme is based on federal law and financed by federal funds. Its aim is to support economic development in East Germany. Consequently it is available only in East Germany. It is administrated on federal state level. Tax allowances under the IZ scheme are granted automatically on the basis of objective criteria under a legal basis giving rights to the beneficiaries to receive the aid. Only formal criteria are evaluated by the federal state authorities. The IZ scheme is currently fading out. Aid intensities are scaled down year-by-year until the year 2013. From 2014 onwards the scheme will not be available any more.

Masdar and Wacker received additionally direct grants based on the GA scheme. This a federal scheme which is complemented by programs on federal state level. It is financed by federal funds, federal states' funds and up to 75% by European funds through the EFRD. The scheme is available for certain less developed regions in both West and East Germany.[124] Support under the GA scheme is not granted automatically. (The criteria for granting aid are presented in the following section).

The three investment projects are located in two federate states ("Länder") of the "Solar Valley" cluster: Thuringia and Saxony. The aid schemes[125] are managed by the regional authorities, which decide on the allocation of aid. This means that, in this particular case study, regional authorities from the same country are not only competing with each other in order to attract investments, but they are able to do so by using regional aid (while in most cases, in other Member States, this will be "arbitrated" by the national granting authorities)[126].

It should also be noted that at the time of the investment, only Thuringia had a strategy for the solar energy sector. The Thuringian Solar Initiative was launched in 2007 – so about at the same time as the investments began. Thuringia already had a focus on the solar industry, being aware of its high importance for the local economy. Guaranteeing the prosperity of this sector would therefore contribute to local economic development. The main objective was for Thuringia to establish itself as one of the leading locations for the production and R&D of solar technologies.

3.2.3.2 Projects evaluation

As stated above, aid under the IZ scheme is granted automatically when certain formal criteria are met.

Aid under the GA scheme is not granted automatically. Beneficiaries need to apply for aid and authorities on federal state level decide whether aid is granted and about aid intensities. Their decisions are based on certain criteria. The criteria are mainly the location of the investment and the size of the beneficiaries (small, medium, large enterprises). However, a discretionary power

[123] The German authorities submitted a summary of the aid schemes in conformity with article 8 of the Commission Regulation (EC) No. 1628/2006 on the application of Articles 87 and 88 of the Treaty to national regional investment aid. The summary of the "Investitionszulagengesetz 2007" (law on investment premiums 2007) was registered at the Commission under XR 6/2007. The summary of its successor "Investitionszulagengesetz 2010" was registered under X 167/2008. The summary of the "36. Rahmenplan der Gemeinschaftsaufgabe - Verbesserung der regionalen Wirtschaftsstruktur" was registered at the Commission under XR 31/2007.

[124] A map showing the eligible regions is available at: http://www.bmwi.de/BMWi/Redaktion/PDF/foerdergebietskarte-ab-2007,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf

[125] In all three cases the aid was granted under existing schemes: investment premiums were granted on the basis of the "Investitionszulagengesetz" and direct grants were granted on the basis of the "36. Rahmenplan der Gemeinschaftsaufgabe - Verbesserung der regionalen Wirtschaftsstruktur" (GA scheme). In one case, 75 % of the aid granted under the GA scheme was financed by the European Fund for Regional Development (ERDF).

[126] In two case studies only, the aids are awarded by regional Granting Authorities: the solar industry in Germany and the paper industry in Spain. In all other case studies, the decision to allocate aid is made at national level.

remains with the federal states. Aid intensities can be higher for investments which are considered to be very beneficial for regional development.

The procedure for evaluating a project's benefits and deciding whether to award aid to it differs from one federate state to another. In Thuringia, a committee decides on the aid offers. Members of the committee are officials from state ministries, from LEG - State Development Corporation of Thuringia, the local development agency and from Thüringer Aufbaubank (Thuringian Development Bank, the local agency responsible for managing aid cases. In Saxony the Ministry of Economy and Labour decides on aid offers.

According to the granting authorities interviewed[127], an aid is usually offered when the granting authorities consider a project generally beneficial for regional development. As a basis for the decision, the assessment of the benefits of a project is usually measured by the number of jobs created and the quality of the jobs in terms of qualification levels – for example, R&D jobs have a higher rating than manufacturing jobs.

As in most other case studies (the Pharmaceutical industry in Ireland is the only exception), economic cost-benefit models are not applied in assessing the value added of an investment project for a region. Interviewees indicated that economic cost-benefit models are not considered an efficient tool. Interviewees from granting authorities mentioned that economic cost-benefit calculations required for certain financial support under European Structural Funds[128] are too costly and not effective for decision-making.

The German authorities notified the aid cases to the Commission. In their notification, they provided the Commission with detailed information on the market, in which the beneficiaries intended to operate, and assessed the potential impact of the aid on competition.

3.2.3.3 Aid amount and intensity level

All three investment projects were awarded the maximum level of aid that is permitted by the RAG. According to the granting authorities interviewed, an aid up to the maximum ceiling of the region is usually offered when the granting authorities consider a project is generally beneficial for regional development. On this subject, one of the interviewees also pointed out that the aid is awarded up to the maximum amount allowed since other eligible regions would usually do the same. This statement suggests that the local authorities recognise that they may be in a subsidy race.

Thuringia and Saxony are located in the same geographical area (Eastern Germany) and in the same cluster (the Solar Valley), and the possibilities they have to differentiate themselves based on hard location factors are limited. Thus, since they are entitled to set the aid amount, Regional granting authorities in Germany tend to use this possibility to the highest extent possible, and find themselves trapped in an expensive "race to the bottom". As will be seen below, investors are reaping the benefits of such a situation.

Moreover, the granting authorities interviewed did not appear to have restrictions on the levels of aid that they were able to offer, apart from the limits set by the RAG. This is one additional explanation to the fact that the highest possible amount was offered. In the case of Ersol, the granting authority stated that Thuringia was competing with a location in the Czech Republic, with the same maximum aid intensity as permitted by the RAG. However, the authorities at the competing location in Czech Republic did not have the budget available to offer aid up to the maximum aid intensity, while the granting authority of Thuringia did. According to the latter, this at least partly explains why the investment located in Eastern Germany rather than in the Czech Republic.

[127] Thuringia: Ministry of Economy, Labour and Technology, Thüringer Aufbaubank (Thuringian Development Bank); Saxony: Ministry of Economy and Labour

[128] So-called "major projects" eligible to the Cohesion Fund and the European Regional Development Fund, and whose total costs exceeds €50 million or €25 million depending on the nature of the project.

3.3 Determinants of investment and location decisions

3.3.1 Determinants of investment decisions

3.3.1.1 Main determinants of investment decisions other than regional aid

According to the interviewees the following factors determined the decision to invest:

Growing demand: For all the projects, the fast growing solar market was a key element driving the investment decisions (see above). In this context, and as explained by the interviewees, all investment projects aimed at increasing production capacities.

In the case of Ersol, as it is common practice in the PV market, the company concluded pre-fixed agreements with its customers of solar cells and modules and its suppliers of polysilicon. This means even before investing in additional capacities, Ersol sold the output to be produced with the new capacities and purchased the inputs needed for the production. Hence, even if a shift on the market could be observed as early as 2008, with demand slowing down while production capacities kept increasing (hence price decreasing sharply), Ersol still had sufficient incentive to increase its production capacities.

Developing technologies: In the Ersol and Masdar projects, the investment included R&D components with the aim of enhancing manufacturing process innovation.

In the case of Masdar, the development of thin-film technology was a key driver of the investment project[129]. The decision to invest was mainly driven by the objective of its parent company – the Abu Dhabi Future Energy Company – to develop the solar industry in Abu Dhabi and its interest in the new technology. The purpose of the investment was to build a reference plant for technology and knowledge transfer to Abu Dhabi. Consequently, not only a production plant, but also R&D facilities were built.

Through its investment, Ersol was also seeking to improve its production technologies for solar cells, and the investment project also included the building up of a R&D centre. In January 2012, about 100 employees were working in Ersol's new R&D centre in Arnstadt.

High operating margins: Although it was not mentioned by interviewees, market analyses indicate that increasing production capacities were underpinned by high profit margins in the sector. From 2004 until Q3 2008, prices of PV modules remained stable, while manufacturers were reducing their costs through technology and scale. This can be explained by the fact that, in Germany and Spain, the two largest PV markets in Europe, tariff incentives allowed project developers to buy the technology at a fixed price. Coupled with a shortage of polysilicon that constrained production and prevented effective pricing competition, this enabled manufacturer to operate high margins, and provided them strong incentives to invest[130].

Need to increase efficiency: At least two of the projects were also specifically driven by efficiency gains at the time of the investment decision.

In the case of Ersol, the company decided that a large investment was necessary, not only to meet market demand in terms of production capacities, but also to enhance the competitiveness of the plant through economies of scale and innovation.

However, other source of evidence tend to indicate that at the time of the decisions and the start of the work, efficiency and competitiveness of sites was not as critical an issues as it became after the market shift in 2008.

[129] The Thin-film modules are less polysilicon-consuming than older technologies. At the time of the investment decision, the price for polysilicon was increasing dramatically. It then encountered a sharp decrease in 2008 as the global demand stayed flat while availability of polysilicon increased. See: UN-Energy knowledge network (2012). "Re-considering the economics of photovoltaic power". Available at: http://www.un-energy.org/stories/2498-re-considering-the-economics-of-photovoltaic-power.

[130] UN-Energy knowledge network (2012). "Re-considering the economics of photovoltaic power". Available at: http://www.un-energy.org/stories/2498-re-considering-the-economics-of-photovoltaic-power.

3.3.1.2 Incentive effect of the aid on the investment decision

For all the projects, the interviewees stated that extensive financial calculations were carried out to estimate investment returns. Aid was always included in these calculations. However, although the aid was, therefore, a factor within the companies' decision-making process, in none of the projects it was considered to have been a deciding factor. According to the beneficiaries, aid is only one element in a complex decision, which is mainly driven by market conditions.

According to an industry expert interviewed, the aid amount is important when negotiating loans with the banks. The aid supports the financial leverage of the beneficiaries. Hence, access to finance and credit conditions can be improved. This can have a positive impact on the investment returns and influence positively the decision to invest; alternatively, this can lead to an increase in the size of an investment. However, no clear evidence for this effect could be established in the three investment projects.

According to both the beneficiaries and industry stakeholders increasing demand, not the availability of aid, was the principal investment driver. Evidence from the market data corroborates this assertion: market outlooks gave incentives for companies to invest in their production capacities, in order to satisfy a growing global demand while also reducing production costs.

3.3.2 Determinants of location decisions

3.3.2.1 Main determinants of location other than regional aid

According to interviewees, the main drivers of the location decision were:

Pre-existing operations: In two cases (Ersol and Wacker Chemie) the pre-existing operations on-site were the most important drivers of the location decision. The pre-existing sites offered advantages that could not be compensated for by alternative locations. The beneficiaries already knew the advantageous investment factors of the location. The extension of pre-existing facilities also offered an opportunity to reach a higher level of efficiency for the investment.

The prospect of internal economies of scale and productivity gains influenced Ersol's decision to locate the investment on an existing site. The pre-existing facilities were also important, because of the management capacities already available at the site. Ersol needed large managerial capacity to cope with the large investment project and were more confident of finding them in the proximity of a pre-existing operational site. The same rationale was followed by Wacker Chemie, when they decided to invest in Germany rather than in the US.

Existing cluster: In two projects (Masdar and Ersol) the interviewees mentioned the advantages of existing clusters and the proximity to ancillary industries and suppliers as a crucial factor for their location decision. The advantages are reflected in reliable communication networks, transport and logistical accessibility, the economic and innovative environment, and proximity to research, development and education institutions. Another interesting example of the cluster effect is provided by Wacker Chemie: Saxony's tradition in the chemical industry provided an investment-friendly environment. The local authorities were aware of the positive socio-economic benefits of the investment and thus helped to obtain the necessary permits.

Availability of skilled labour force: In the same two projects (Masdar and Ersol) the availability of a qualified labour force in the location selected had an influence on the location decisions. This is to a large extent related to the fact that, in both cases, the beneficiaries not only invested in new production facilities, but also in R&D centres. The presence of a solar industry cluster provided some guarantee of finding the necessary qualified and experienced labour force.

Availability of land: In all three projects, the availability of land was crucial for the location decision, as new production facilities were part of the investment projects. Moreover, in two projects the availability of additional land after the completion of the project was important, as they foresaw the possibility of engaging in follow-up investments.

Support of local authorities: In all three cases, the beneficiaries mentioned as a reason for selecting the investment location the good relationship they were able to establish from the outset with the local authorities and especially the investment agencies. Interviewees indicated that they received strong and professional support from the local authorities not only in terms of the state aid support mechanisms, but also with all the necessary information and support to facilitate the investment decision.

It is noteworthy that the **cost of labour** was not mentioned by the beneficiaries as being a significant location factor. This is all the more remarkable that the Investment and Marketing Corporation Saxony-Anhalt advertises the region as offering lower unit labour costs based on gross value added (GVA) than the US, Japan, South Korea and the German average.

Interestingly, none of the beneficiaries mentioned the local market as being a location driver either. This would suggest that the investments were not significantly driven by the demand for PV products in Germany so much as global demand.

3.3.2.2 Incentive effect of the aid on the location decision

Decision mechanisms:
The selection process of an economically optimal location for the investment was described by the beneficiaries as a two-step process.

The first step consists of a screening exercise, in order to identify regions that the most economically beneficial. The screening consists of an assessment of difference regions based on hard location factors mainly, e.g. availability and the costs of land and a qualified workforce. In order to collect information detailed information, beneficiaries usually send a request to the local authorities in pre-identified regions. This request can be sent anonymously, through consultants, thus leaving the local authorities ignorant of which company is interested in investing. In one of investment projects analysed, the first contact involved a relatively simple request to fill out a table with certain information on the location. The possibility of aid and the potential aid intensity was also part of this questionnaire, hence indicating that the estimated aid amount is a relevant factor taken into account in the location decision.

A second step involves direct and open contacts with the Regional authorities. Hence, this second step is also driven by soft location factors, such as the relationship with the local authorities. The amount of aid is also discussed further.

Alternative locations:
In two projects, the companies stated that they considered investing in other eligible and non-eligible regions in Germany. However, in all three projects, the companies also considered investment locations outside the EU. All interviewees mentioned the US and China as the main alternative countries for the investments. In one project, the beneficiary initially declined to invest in the US and invested in Germany. However, the company eventually decided to invest in the US as well.

For its investment, Masdar only considered locations in Germany. According to the beneficiary, this is because Germany has the greatest knowledge and R&D base relevant to the solar industry. This is an important factor for a plant that is intended to serve as a flagship within the company. The main alternative location in Germany was Hanau. Hanau is located close to Frankfurt/Main in the state of Hessen, one of the strongest economic regions in Germany which is not eligible for state aid. Reasons to invest in Hanau would have been the good public R&D infrastructure and the proximity to Frankfurt's airport, with convenient connections to Masdar's headquarters in Abu Dhabi. However, Masdar decided to locate the investments in Thuringia instead, because the region offered state aid.

Ersol considered several alternative locations, including Saxony in Germany, the US and China. Aid would have been available at all these locations. According to the granting authority, a location in the Czech Republic was the main alternative location. Thuringia was chosen eventually, due to the higher amount of aid offered.

In the case of Wacker Chemie, the main alternative location was in the US[131]. Since energy constitutes a significant cost factor for the production of polysilicon, lower energy costs were the main reason for choosing the US over Germany. However, lower energy costs in the US did not outweigh the advantages of extending an existing site in Saxony, in terms of lower risk and internal economies of scale. It should be remarked that both the US and Saxony offered state aid, although it was not been possible to establish whether this was at the same levels.

Incentive effect of the aid

According to interviewees, the availability of state aid was deemed to have an important influence on the location decision in all three projects. All beneficiaries stated that the aid provided an incentive to locate the planned investment in the region selected. This was confirmed by the granting authorities and sector experts, according to whom, if no aid had been offered, the investments would have been made in another location where aid was available.

These statements seem credible, but it is important to consider the counterfactual. When stating that, without the aid, investors would have invested in another region where aid would have been offered, the beneficiaries and experts take for granted the subsidy race in which the granting authorities are actively seeking to attract investment from the solar industry. However, the question remains, whether other location factors such as pre-existing operations, the solar cluster and the availability of a skilled labour force would have been sufficient to attract such investment in East Germany, irrespective of the availability of state aid. The replies from the beneficiaries indicate that they consider aid as part of their business model.

3.4 Benefits of the investments

At the time of collecting data (in June 2012), all investment projects were completed.

Table 9: Projects status and achievements[132]

Beneficiary	Status	Planned				Achieved*			
		Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/job (k€)	Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/job (k€)
Ersol	Completed	55.1	525.5	689	80	55.1	525.5	1,000	55
Masdar	Completed	28.6	143.5	500	60	28.6	143.5	200	143
Wacker Chemie	Completed[133]	97.5	800.0	n/a	n/a	97.5	800.0	500	195

Aid (m€): Total aid amount in million Euro
Invest. volume (m€, nominal): Total nominal eligible investment sum in million Euro
New jobs: number of jobs created
Aid/new job (k€): Total aid amount per job created in thousand Euro
Euro equivalent calculated based on exchange rate on the date of the notification
figures in () indicate a reduction in the number of jobs at the site

[131] In 2011, Wacker finally decided the construction of the new polysilicon facility in Tennessee in the United States. Retrieved from: Wacker Chemie AG Annual Report (2011).

[132] European Commission, State aid register (2012). Interviews with granting authorities and beneficiaries.

[133] Works completed in April 2012, full production capacity expected by end 2012. Retrieved from: Chemicals technology. "Wacker Chemie polysilicon Production Plant, Nuenchritz, Saxony". Available at: http://www.chemicals-technology.com/projects/wacker-chemie-polysilicon-production-saxony/

3.4.1 Effects on direct jobs

Gross change in direct jobs

As shown in Table 9 above, all investments created many jobs. Ersol and Wacker Chemie are among the most beneficial projects in terms of the number of jobs created in the whole sample of investment projects analysed. This partly explains the high amount of aid to these projects, although the aid amount per job created remains at the upper end of the range as compared to other case studies in this report. Unfortunately, no data on employment in the solar industry could be collected in order to set the baseline to those figures.

According to beneficiaries, the job creation did significantly benefit the investment regions. The ratio of employees brought to the region as "expatriates" did not exceed 20% in the case of Masdar, 10% in the case of Ersol, and 5% in the case of Wacker Chemie . Moreover, in all projects more than 80% of the newly hired employees live within a 50 km radius of the investment site.

Finally, it is worth mentioning that in addition to new jobs, Wacker Chemie states that they increased the number of apprenticeship places by 25% as a result of the investment.

At the time of data collection, the plants considered were not affected by the market downturn. However in October 2012, demand for polysilicon from the PV industry was falling and Wacker Chemie introduced shorter working hours; 650 workers were said to have been affected[134].

Quality of jobs and training

Both Masdar and Ersol invested in building an R&D Centre. Ersol also invested in the construction of an administrative centre for the company at the investment location. Masdar's investment included the establishment of a training centre for some 100 young trainees.

According to the granting authorities interviewed, these investments in human resources can be regarded as being particularly beneficial for regional development. While a large number of production jobs have already been created in Eastern Germany overall in the last 20 years, the number of higher-value R&D and administrative jobs remains relatively low compared to Western Germany. Therefore investment projects in R&D or high-value administrative functions are seen to be beneficial for the development of the whole region and are supported accordingly.

According to the beneficiary, Wacker Chemie increased its R&D expenditure by 25% as a result of the investment, which was said to have a highly positive impact on the overall quality of jobs on site. Wacker Chemie and Masdar also indicated that they are spending respectively some ca. €200,000 and €100,000 on training new employees annually, which is comparatively low, especially taking into account the relatively high number of hires.

3.4.2 Indirect effect on jobs and additional demand in the regions

Indirect effect of the investment phase

During the investment phase of its project, Wacker Chemie estimates that it spent 18% of the total investment sum on works, goods, and services from suppliers within a 50 km radius of the investment site. During the construction period, up to 1,000 people worked on site. According to the interviewees, this also increased turnover for local service providers, such as the catering industry and hotels.

Masdar estimates that more than 80% of the total investment sum was spent with local suppliers within a 50 km radius of the investment site, while only 8% was spent locally in the case of Ersol. Discrepancies between investment projects could not be explained.

Indirect effect of the operating phase

The beneficiaries also estimated that their investments had a positive impact on their *supplier base*. Wacker Chemie and Masdar estimated that they spend 15% and 50% respectively of their

[134] Finanz Nachrichten (2012). "Wacker Chemie affected by lack of Polysilicon demand". Available at: http://www.finanznachrichten.de/nachrichten-2012-10/24870544-wacker-chemie-affected-by-lack-of-polysilicon-demand-451.htm

additional turnover within a 50 km radius of the site. The estimated number of indirect new jobs ranges from 20 to 800 (these discrepancies cast some doubts on the quality of these estimates and point to possible interviewee bias).

All beneficiaries claim that their investment induced additional investments by local suppliers. Wacker mentioned the example of a pipe-cleaning company, which constructed new facilities and hired additional workforce.

Masdar was the only company for which it was possible to identify an impact from the investment on the *client base.* Masdar estimates that 10% of its annual turnover was generated with clients located in a 50 km radius around the site. This however was generated by a one-off investment by a local client: Masdar built a solar plant for presentational purposes. This induced an investment of €25 million by a local client. Representatives of Masdar indicated that they do not expect any similar repeat investment in the next few years.

3.4.3 Other effects

R&D activities

All three projects had a positive impact on R&D. In the case of Masdar and Ersol, investment projects included the creation of new R&D centres, and all projects include R&D activities, which represent €2 million to more than €10 million of annual budget depending on the project.

For this reason, both investments were described by the local authorities and sector experts as highly valuable for the regions: According to interviewees, the value of such investments derives not only from the highly qualified jobs that are created, but also from the impetus they gave to the solar industry cluster. It is also the view of the beneficiaries, granting authorities and sector experts, that R&D investments are more likely to generate spill over effects than other types of investment.

Cooperation with higher education institutions

Masdar and Ersol strengthened or established cooperation with universities in their regions. This is linked to a large extent with their investment in R&D activities. Universities outside the region have also benefited from new opportunities offered by the R&D centres.

Spill over and clustering effects

Masdar's investment provided a positive impetus to development. The granting authority sees Masdar's investment not only as a large productive investment generating jobs in the region, but also as a catalyst for further development of the solar industry in the region. The construction of an R&D centre, focusing on a new and promising technology and with a yearly budget of around €2 million, is considered by the granting authority to be a major contribution from Masdar's project to the development of the solar industry in the region. The new centre is expected to help build a technology-specific supply chain and infrastructure, and then attract more (foreign) investments related to the new technology.

Furthermore Masdar was one of the first investors in the "Erfurter Kreuz" industrial area. The area was selected by the Thuringian government as the main site for new Greenfield industrial facilities based on a strategic decision process. The decision was based on a screening of potential sites for industrial development across the whole area of Thuringia. "Erfurter Kreuz" now possesses a diverse industry structure (companies from the solar industry, automotive sector and industrial machinery are located in the area). However, Masdar was one of the first investors in this area and helped – according to the interviewees from Thuringian authorities –to establish the industrial area as a whole.

Spill over effect is expected from the Ersol's project too. The beneficiary's large investment caught the attention of other companies that were interested in learning more about their decision to invest and their experiences in the region. Consequently, Ersol is working with the local authorities and supporting their efforts to attract more investments.

3.5 Impact on competition

This section will analyse the potential impacts that the projects considered in the case study may have on the overall level of competition in their respective markets. To do so, the potential excesses in the market power of each firm as well as the inefficiencies of the market structure itself are screened. The former, by considering the market share of each company in each of the markets it covers and the barriers to entry that characterize them. The latter, by assessing the conditions of the markets and the potential situation of overcapacity. The considerations are then summarized in order to understand the potential negative effects on the competitors, mainly in terms of crowding out effect.

3.5.1 Potential distortion due to excessive market power[135]

3.5.1.1 Polysilicon market (Wacker Chemie)

Market shares

The global industry is dominated by seven companies that supply around 90% of the total polysilicon market: Hemlock, Wacker Chemie, REC, MEMC, Tokuyama, LDK Solar and OCI Company increasingly challenged by the Chinese GCL.

The limited number of suppliers in combination with supply shortage has seen average gross margins as high as 83%, although they have been reported to have reduced to 49% by May 2009[136]. In the light of these figures the position of Wacker Chemie comes under particular scrutiny, being the second largest global producer of polysilicon, declaring its intention to invest in new plants so to enlarge is productive capacity and already operating fully integrated chemical plants.

The polysilicon market has been expanding after the aforementioned shortage situation that lasted till 2007. Over the same period, the market share of Wacker Chemie has not been increasing, and in 2011 the company accounted for a 12% market share[137] compared to the [15-20]% reported in the Commission decision in 2009[138]. It is interesting to note how the market shares of two main competitors like OCI and GCL grew faster, with OCI accounting for a little more than 12%[139] of the market in 2011 as the first world supplier of polysilicon.

[135] This section relies heavily on data released by Green Rhino Energy and are available at: http://www.greenrhinoenergy.com/solar/

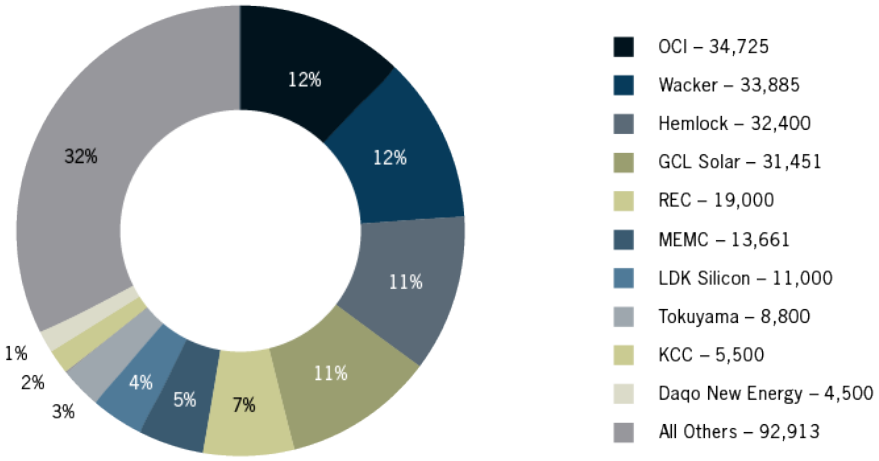
[136] Green Rhino Energy (2012). Polysilicon market analysis, cost structure and margins section. Available at: http://www.greenrhinoenergy.com/solar/industry/ind_01_silicon.php

[137] GTM Research reported by Recharge News (2012). " Wacker polysilicon sales dip as customers walk away from PV". Available at: http://www.rechargenews.com/energy/solar/article299917.ece

[138] European Commission, State aid N 221/2009 – DE – LIP – Wacker Chemie AG. Available at: http://ec.europa.eu/competition/state_aid/register/ii/by_case_nr_n2009_0210.html

[139] GTM Research reported by Recharge News (2012). " Wacker polysilicon sales dip as customers walk away from PV". Available at: http://www.rechargenews.com/energy/solar/article299917.ece

Figure 14: Market shares of the top 10 polysilicon producers in the world[140]



However, the increase in production matched by Wacker Chemie permitted the company to keep pace with the rivals and still be listed in the top four companies in 2011. This is important because even if market power did not increase per se, productive capacities were boosted by an aided investment.

Barriers to entry
The production of Polysilicon is a very high fixed cost business with an associated potential of entry barriers: the industry is characterised by high capital requirements ($500 million - $1 billion for building a plant), and long lead times to add capacity; access to cheap energy is also a requirement, as the purification process requires a lot of energy (for instance, Wacker Chemie has own hydro power and co-generation unit for its plant). Hence, there are synergies of operating a fully integrated chemical plant with cost advantage over pure-play silicon producers.

Most customers have long-term contracts with existing suppliers, making it even more difficult for new entrants. Due to the supply shortage 2006-2008, 90% of the market is governed by fixed supply agreements lasting on average for between 6 to 10 years.

3.5.1.2 Manufacturing wafers (Wacker Chemie and Ersol)

Market shares
The wafer industry is dominated by five companies sharing over 90% of the market. There are however, many smaller companies competing for a degree of market share. The wafer industry is much less of a fixed cost business than polysilicon production.

Average margins have come down from 20% in 2008 to just 6% in 2009, which in part explains the need to focus on cost control. Here the risk of a potentially negative impact on competition is higher since Wacker Chemie is already in a leading position and enjoys vertical integration towards the supply of polysilicon.

Barriers to entry
Standard production facilities can be bought "off the shelf". Although a significant capital outlay is required, companies that are on either side of the value chain are well positioned to move into this segment. As the process and output of ingot growing and wafer cutting are fairly standardised, it is relatively easy for polysilicon producers to forward-integrate into wafer cutting, thus becoming direct competitors to established wafer cutters.

[140] GTM Research(2012). "Polysilicon demand and supply forecast 2012-2016". Available at: http://www.greentechmedia.com/research/report/polysilicon-2012-2016/

3.5.1.3 Manufacturing crystalline modules (Ersol Solar Energy)

Market shares
Crystalline modules are manufactured based on silicon wafers. There are a large number of module manufacturers. Many of the leading module manufacturers are also cell manufacturers (modules are made up of several PV cells, which are the electrical device that converts the energy of light directly into electricity by the photovoltaic effect; hence producing cells is a partial upstream verticalization).

The vertical integration of Ersol and the fact of being part of a larger group offer to the company an advantage over minor manufacturers. However, the relatively low market share (Ersol is not within the global top ten producers) limits the possible distortive effects of the aid.

Barriers to entry
Capital requirements and energy requirements for modules are much less than for the other processes. Within this context, the main differentiating factor is efficiency. In an industry that is suffering from low utilization technical differentiation is the one aspect that can shelter margins.

3.5.1.4 Thin-film modules (Masdar and Ersol)

Market shares
Thin-film modules are a substitute to crystalline modules. Thin-film technology uses different grades of silicon or other PV materials. The varied and dynamic nature of this market helps avoid possible reinforcements of the present market position of the companies.

Barriers to entry
For development and small-scale production, there are few barriers, as companies like Aja International specialise in providing small-scale production (sputtering) equipment. This is a very dynamic segment with lots of up-start companies, some venture capital funded. There are also a number of PV manufacturers that produce both crystalline and thin-film modules.

3.5.2 Potential distortions due to market inefficiencies

Polysilicon market (Wacker Chemie)

Market conditions
Firstly, it is important to state that at the time of the investment decisions, the situation was marked by general growth for the market in terms of installation of PV modules and a shortage on the supply side of polysilicon. Both polysilicon companies and downstream manufacturers were expanding rapidly, encouraged by positive market outlooks, continuous improvements in technology and scale, and high profit margins.

The scenario however changed in the end of 2008, when polysilicon price (and margin) fell sharply[141]. The main reason of this shift is to be found in the Spanish incentive regime abrupt ending in September 2008. Despite steady growth on the German and Italian markets, the loss on the Spanish market saw global demand staying broadly flat, while polysilicon availability kept increasing rapidly. In other words, while the overall market for PV modules slowed down, the production of polysilicon remained at the pre-2008 levels. This created a situation of overcapacity within the polysilicon market by the end of 2008.

The market situation from 2009 onwards showed persistent overcapacity from the polysilicon supply side that still hinders the market performance and constitutes a problem for all the players, also considering that forecasts for future prices still look gloomy[142]. In this situation of persistent overcapacity, as mentioned in the market power section, demand is still growing. Growing demand, weakening prices and overcapacity are potentially confusing signals. With

[141] For a graphical illustration, see: Green Rhino Energy (2012). “Polysilicon market analysis”. Available at: http://www.greenrhinoenergy.com/solar/industry/ind_01_silicon.php

[142] Evertiq (2012). "Solar polysilicon supplier must cut production to end oversupply". Available at: http://evertiq.com/news/22875

reference to the Commission's methodology to assess the potential impact of aid on competition, the market should be underperforming to justify worries about its efficiency.

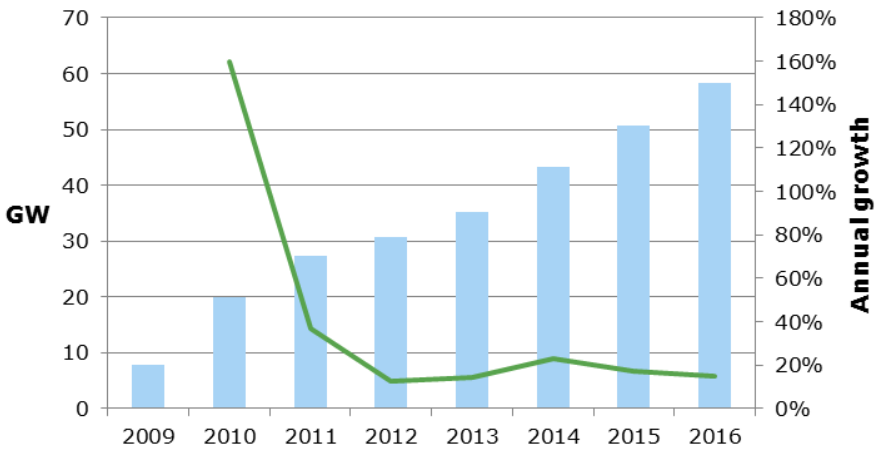
During the 2008-2012 period, the demand for polysilicon has been growing so the market is not in absolute decline. It may however be in relative decline, since the polysilicon market is to be considered worldwide[143], thus the growth rate in the market is to be compared to that of the world economy. Lacking precise figures for the growth of the polysilicon market it is difficult to make a thorough comparison, still it appears that the market followed the GDP.

Overcapacity
Overproduction is the principal indicator of potential dysfunction within the polysilicon market. On this basis it is clear that an increase in productive capacity in a period like this could have a distortive effect, adding output in an already saturated market. That is why the Wacker Chemie aided investment project could have worsened a situation of market inefficiency. The German authorities notified their intention to provide regional investment aid in favour of Wacker Chemie for setting up a plant to produce polysilicon for the solar industry in April 2009, i.e. eight months after the dramatic shift described above. As previously highlighted the cost structure for polysilicon is largely fixed, with energy costs accounting for 85% of the final output cost. In a context of a sharp drop in price, Wacker Chemie could have benefited from being able to rely on internally produced energy.

Manufacturing wafers and crystalline modules

Market conditions
For the PV market the global trend showed a slowing down in demand in 2009, although market outlooks remained positive at that time and the solar industry has seen significant growth following the 2008-2009 recession. The annual installed amount of PV solar systems by manufacturers (expressed in GW) increased by ca. 160% in 2010 as compared to the previous year, and by ca. 40% in 2011.

Figure 15: Global PV installations – GW and annual growth [144]



The end of the Spanish tariff incentive regime in Spain in 2008 (and later in Germany in 2012), saw wafer and module makers starting to compete on price as their margins were eroded[145]: the price fell rapidly from $4.00/W in 2008 to $2.00/W in 2009. This was made possible by the reductions in costs achieved over the previous years, driven by scale and advances in wafer, cell

[143] European Commission, State aid N 221/2009 – DE – LIP – Wacker Chemie AG. Available at: http://ec.europa.eu/competition/state_aid/register/ii/by_case_nr_n2009_0210.html
[144] Graph based on data retrieved from IMS Research (now part of HIS), cited in PV Market research (2012). Available at: http://www.pvmarketresearch.com/free-resources/research-data.php
[145] For a graphical illustration, see: Green Rhino Energy (2012). "Silicon Wafer market analysis". Available at: http://www.greenrhinoenergy.com/solar/industry/ind_02_wafers.php

and module manufacturing processes, as well as to improved performance resulting from better cell efficiencies and lower electrical conversion losses[146].

For these reasons, the picture on the wafers and modules market in less clear than on the polysilicon market, as investments were undertaken and subsidised at a time of increasing demand, and that such investments also appear to be logical responses to the ending of the tariff incentive regimes.

Overcapacity
Despite overcapacity within the sector, efficiency improving investments as well as focusing on R&D have been observed responses to avoid exiting the market.

3.5.3 Effects of aid for competitors

Overall, the risk of a negative impact of aid for competitors is highest in the case of Wacker Chemie. There are at least four sources of concern. Firstly, as one of the few producers of polysilicon worldwide, Wacker Chemie is occupying a dominant position within the polysilicon market, and market power should have been a matter of cautious at the time of granting aid, even if Wacker Chemie's market share did not exceed 25%. Secondly, after the market downturn in the end of 2008, vertical integration towards the supply of polysilicon and wafers gave Wacker Chemie further advantages, as margins decreased and energy prices increased. Thirdly, in addition to market power, market inefficiency became a matter of concern 2008, as the aided investment added further production capacity in polysilicon supply on a saturated market. Finally, the amount of aid offered to Wacker was particularly high (€97.5 million, i.e. the second largest amount within the whole sample of 28 investment projects analyzed for the evaluation), which is likely to increase the risk of distortion. As a final remark, in a market growing more competitive and expanding its productive capacity significantly in excess of the demand level, the capacity of Wacker to keep a high market share was surely positively influenced by the aided investment, raising questions about the potentially distortive effect of the aid.

The German authorities notified their intention to provide regional investment aid in favour of Wacker Chemie in April 2009, i.e. eight months after the dramatic shift described above. The Commission's decision was published in September 2009. The competent authorities did not identify these concerns.

For the other two investment projects in the area of manufacturing wafers and crystalline modules, no apparent evidence or risk of distortion of market competition can be observed[147].

3.6 Conclusion

As far as the case study on the Solar Industry in Germany is concerned, the following conclusions can be drawn:

Determinants of investment or location decisions of the aided firms
In spite of the relatively high aid amounts and intensities offered, there is no significant evidence indicating that regional aid alone governed the initial investment decisions of the three companies considered in this case study. Beneficiaries stated that the central drivers for investment were growing demand, technological innovation, and high profit margins that were positively impacted by tariff feed-in systems in Germany and Spain alongside a global shortage of polysilicon. Potential efficiency gains were also a reason to invest.

According to the beneficiaries regional aid did influence their location decisions. All beneficiaries stated that they had considered alternative locations (in other eligible and non-eligible regions in Germany, the EU and outside the EU) and for all three projects, interviewees stated that regional aid was a significant driver to invest in the chosen locations. However, the counterfactual remains

[146] UN-Energy knowledge network (2012), "Re-considering the economics of photovoltaic power". Available at: http://www.un-energy.org/stories/2498-re-considering-the-economics-of-photovoltaic-power.

[147] To assess the potential impact on competition, a total of 20 competitors were approached, and only one accepted to answer to our questions. According to the interviewee, the aided investment projects did not have any observable effects on its activity.

unclear and other factors such as these being pre-existing sites, a well-established solar cluster and a qualified workforce were evident factors in the choice of location. Hence, it cannot be categorically assumed that, without aid available at all, investments would have been located elsewhere.

Consequences of the investments in terms of regional and employment benefits and externalities

The investments appear to have been beneficial for the regions. They created direct and indirect jobs, enhanced the knowledge base in the regions and helped to foster the local solar cluster. In addition, it seems that all aided plants have as a result of investment been able to improve their ability to mitigate the impact of the global recession and slow down within the PV market.

Whether such investment offered value for money is more difficult to establish. In two projects, the amount of aid offered corresponded to the maximum ceiling permitted by the RAG. Investors stated that they had considered alternative locations in Germany and elsewhere in Europe, and regional aid contributed to fostering the attractiveness of less developed regions. However, it also appears that there has a degree of competition amongst German Länder, with the maximum level of regional aid (according to the RAG) being systematically awarded to investment projects. There is evidence that other regional authorities may not have been in a position to offer aid at the same level as for these Länder, which suggests this to be an area for review by the European Commission.

The distortive effects of aid for competitors and/or other regions

In terms of any broader impact on competition, Wacker Chemie has benefited from regional aid while it was occupying a dominant position within the polysilicon market, which in itself is characterised by a degree of market concentration and notable barriers to enter. It is also evident that Wacker was awarded aid at a time when the market was developing overcapacity and new competitors were aggressively operating on it. For this reason, it is conceivable that the given aid may have negatively impacted upon competition, especially as the overall amount of aid was high.

For the other two investment projects, no distortion of market competition could be identified. It is clear that given the underlying nature of the market, the risk of such distortion is significantly lower.

Difficultly in establishing the impact of regional aid on national, European and global competition is exacerbated by the dynamics of the solar market and in particular the global levels of state subsidy within both production and consumption sectors. This suggests that greater consideration should be given in the future as to where, when and at what levels regional aid should be permitted. It is also evident that is such a volatile market that there is a need to undertake on-going monitoring of the market.

4. AUTOMOTIVE INDUSTRY – SLOVAKIA/HUNGARY

This third case study focuses on the car industry in Slovakia and Hungary. It builds on a selection of three investment projects.

4.1 Background

The first section provides a general overview of the automotive industry and its developments. The starting point is the condition of the global market, with its macro-trends and evolution over the past decades. The focus is then put on the conditions of the European market. In particular, insight is provided on how the industry has evolved in Central and Eastern Europe (CEE), the region in which the analysed projects are located.

4.1.1 Introduction to the Automotive Industry

The automotive industry is a leading employer worldwide, with nine million people involved in making approximately 60 million vehicles and equating for five percent of global manufacturing jobs. Indirect employment from automotive activity is estimated at 50 million jobs[148]. The global automotive industry includes auto manufacturing and auto component manufacturing. Auto manufacturing consists of the production of passenger cars, light commercial vehicles, heavy trucks, buses, and coaches. The auto component manufacturing encompasses the production of all components required for the manufacturing of automobiles (including textiles, plastics, rubber, iron, steel, glass, aluminium and computer chips). The automotive industry also involves significant research and development activity, representing investment of nearly $85 billion[149].

Globalisation and consolidation in the automotive sector

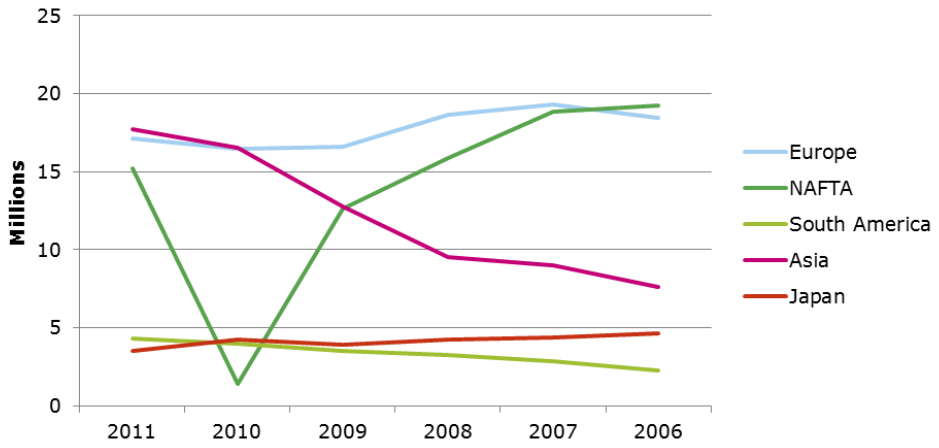
The automotive industry has been facing significant change over the last decade and a half and the process of globalisation and the economic crisis has affected both sales and production. Although the automotive industry has grown globally, important discrepancies in manufacturing costs and variations in distribution of the demand of vehicles worldwide have had an asymmetric impact on car manufacturers. Car production in emerging countries and especially in the BRIC countries (Brazil, Russia, India and China) has grown rapidly. Emerging countries have become increasingly important markets for automotive manufacturers. As illustrated in the figure below, auto sales in the BRIC have increased steadily since the early 2000's, and remained unaffected and even reinforced during the post 2008 downturn period. Meanwhile, sales in the EU, Japan and the USA were stable before the 2008 crisis and they have been falling since this time[150].

[148] Report Linker (2012). Global Automobile Retail Report 2012. Available at: http://www.reportlinker.com/ci02294/Automotive.html. According to the International Organization of Motor Vehicle Manufacturers the worldwide production of new vehicles in 2011 was 59,946,698 http://www.oica.net/category/production-statistics/

[149] Report Linker (2012). Global Automobile Retail Report 2012. Available at: http://www.reportlinker.com/ci02294/Automotive.html.

[150] Retrieved from: Business and Economy (2012). Global auto report 2011. Available at: http://www.businessandeconomy.org/15092011/storyd.asp?sid=6374&pageno=1

Figure 16: Global auto sales 2006-2011 (millions of units)[151]



Production units have been transferred to these countries due to the considerably lower production costs (mainly consequence of the lower labour costs). Competitive pressures and the need to develop synergies have fostered a process of consolidation in the sector. Mergers, acquisitions and agreements among manufacturers have served to consolidate a small number of increasingly larger car-making groups (see Figure 17). The American manufacturers have lost relative weight. European manufacturers have established production sites and purchased organisations in emerging markets, either as subsidiaries or joint ventures. In Asia, Japanese and Korean competitors have strengthened their positions and new players have entered the market. [152] The most significant example is Chery, a car manufacturer founded in China in 1997 which by 2010 was already producing 650,000 cars annually[153]. All these changes have also had an impact on the market share of car-making groups. For instance in 2006 Toyota overtook General Motors as the biggest manufacturer worldwide[154]. Only four years later, in 2011, Toyota was replaced by Volkswagen as the world's leading manufacturer[155].

Overall the forecast in the worldwide market for the next few years continues to be positive still demonstrate underlying competitiveness as well as trends in production and growth. According to the estimate reported by The Economist, the number of cars produced by the current market leader is likely to double by 2018[156].

[151] Graph based on data retrieved from ACEA Pocket Guides 2012-2010-2008, availables at: http://www.acea.be/

[152] Institute of Research on Information Systems (EBS) and iPoint-systems GmbH (2009). "Automotive Industry – Implications for Business Processes and Information Systems", White Paper.

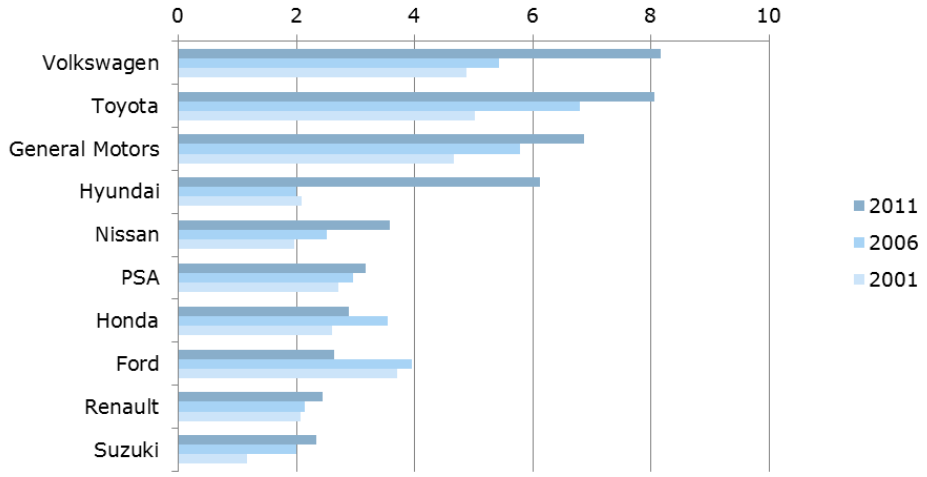
[153] APCO Worldwide (2010). Market Analysis Report: China's Automotive Industry. Report prepared for IEICI

[154] International Organization of Motor Vehicle Manufacturers (2011). World motor vehicle production. Available at: http://oica.net/wp-content/uploads/ranking-2010.pdf

[155] The Economist (2012). " VW conquers the world. Germany's biggest carmaker is leaving rivals in the dust". Available at: http://www.economist.com/node/21558269ttp://www.economist.com/node/21558269

[156] Ibidem.

Figure 17: Top car-making groups' worldwide sale (millions of units)[157]



Despite significant market (past and expected future) growth, the automotive industry is facing a structural overcapacity at a global level[158]. There is a close link between capacity utilisation and profitability. As a rule, car makers break even when capacity utilisation rates reach 80%, with some variation between plants. From a world-wide perspective, current output levels in the car industry are well below the production potential. Short-run fluctuations and long-run under-utilisation of existing capacities are quite distinct phenomena and highlight different aspects of car markets. Car sales are cyclical and a downturn in the car market induces a temporary under-utilisation of capacity[159]. Persistent sluggish growth in sales in the mature markets coupled with growing demand and production in developing markets have created a problem of under-utilisation of production sites within mature markets. The wave of plant closures is a clear signal of this trend. The closure of MG Rover took place in 2005 removing 200,000 units of capacity, the closure of GM Antwerp in 2010 took away 120,000 units and the closure of Saab at the end of 2011 took away 200,000 units capacity. Now Mitsubishi have announced the closure of the Nedcar plant in the Netherlands by the end of 2012, taking away a further 120,000 units of capacity.

Structural changes in the value chain structure

Over the last two decades, the global automobile industry has undergone far-reaching structural change. While in the past car companies produced almost the entire vehicle within their production lines, large parts of value-added are now outsourced, assigning a much larger role to auto parts suppliers than in the past. With Original Equipment Manufacturers (OEMs) concentrating on downstream activities, independent suppliers have taken over former OEMs' development, production and logistics tasks. They are driving innovation and increasingly assume responsibility for coordinating the complex supplier network[160].

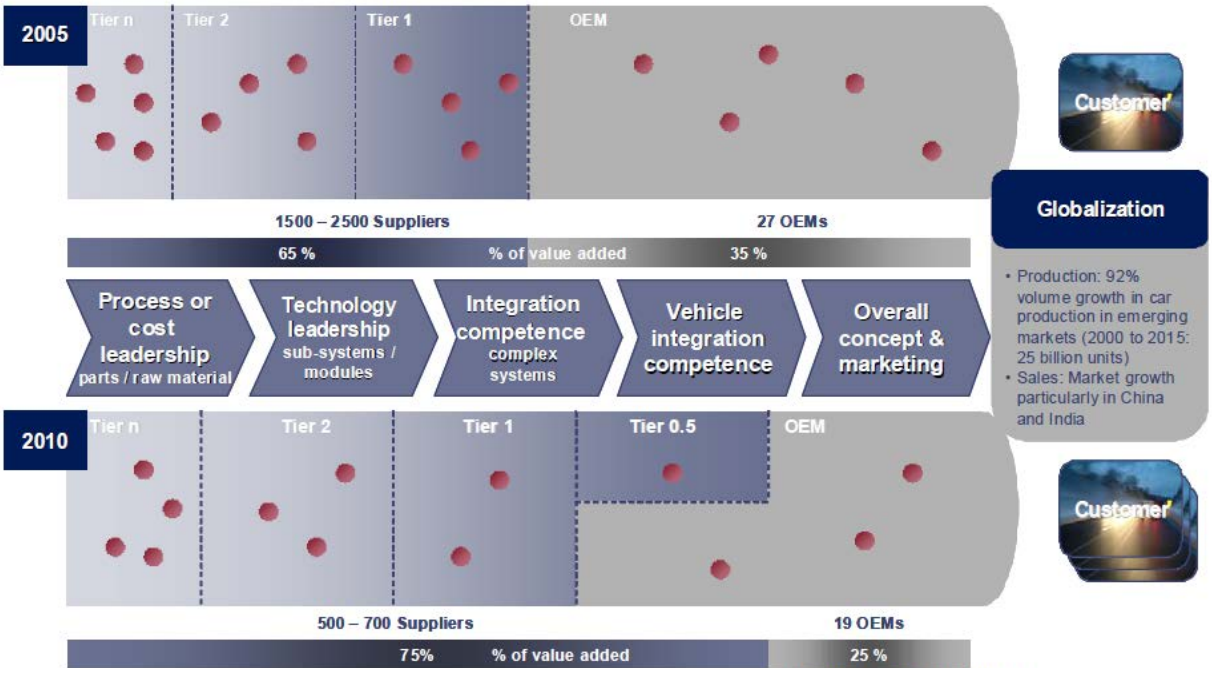
[157] Graph based on data retrieved from: International automotive industry organisation (OICA). Available at: http://oica.net/category/production-statistics/

[158] For a more detailed description structural overcapacities see: European Commission (2005). European Competitiveness Report 2004, p. 167.

[159] http://trade.ec.europa.eu/doclib/docs/2005/march/tradoc_122064.pdf

[160] Institute of Research on Information Systems (EBS) and iPoint-systems GmbH (2009). "Automotive Industry – Implications for Business Processes and Information Systems", White Paper.

Figure 18: the structure of the automotive industry, shifting value-added[161]



Decisions to deverticalize were largely driven by the need to seek cost optimisation in a context of enhanced competition at global level, increasing regulation in the sector (especially in the EU e.g. in terms of the environment and safety) and the customisation of car models (i.e. through increasing combinations of optional equipment). Competition is particularly intense for the small car market. The narrowing of profit margins have forced producers of lower segment cars to shift production to countries with lower production cost, including Central and Eastern European Countries (see below), whereas premium segment cars are, for the time being, still largely assembled at traditional sites[162].

4.1.2 The automotive industry in Europe and in the Visegrád countries

The EU is the world's largest producer of motor vehicles and the automotive industry is a key sector for Europe's economy. The value-added in the automotive industry represents around 8.5% of total value-added generated by manufacturing in the EU (27 Member States) and is responsible for around 1.5% of the total output produced by the EU economy[163]. Taking into account the entire supply chain, covering vehicle manufacturing, suppliers, distribution and after-market-services, the industry provides jobs to over 12 million people and contributes positively to the trade balance to the tune of almost €92 billion (2011) after €74 billion in 2010 and €39 billion in 2009[164].

Yet demand in the European market is problematic and data on car registrations over the last eight years demonstrates the relative weakness of the recovery after the 2002 slowdown in the global economy

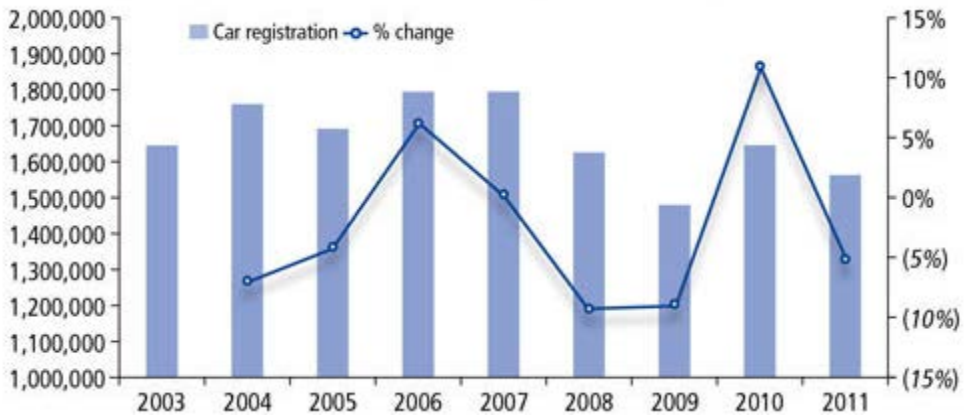
[161] Ibidem.

[162] The International Monetary Fund (2006). The Automobile Industry in Central Europe. Available at: http://www.imf.org/external/cee/2006/1106.pdf

[163] Ward, T. and Loire, P. (2008). "Employment, Skills and occupational trends in the automotive industry". Annex Report by Alphametrics, p. 2. Data source: Eurostat.

[164] Communication Department of the European Commission (2012). "Vision 2020: CARS 21 Group delivers recommendations to help car industry reach new heights". Available at: http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/12/419&type=HTML, accessed on: 08/01/2012

Figure 19: New passenger car registrations in the EU[165]



In order to clarify the context in which the investment projects selected in this case were put in place, it is important to focus on the performance of Central and Eastern European countries. Over the past few years, as Western Europe has stagnated, the new EU members from the CEE have contributed to the slow growth encountered on the overall European automotive market. However, with the arrival of the global financial crisis, the overall European new passenger car registrations in 2008 recorded the sharpest decline since 1993, falling by 7.8% to 14.7 million units. Western European demand contracted by 8.4%, while sales in new EU Member states were down 10.7% (the sharpest decline since ACEA started reporting figures for this region in 2004)[166].

The Visegrád group countries: Poland, Czech Republic, Hungary and the Slovak Republic make up an important productive cluster for the European automotive industry. The IMF noted how assembly plants in the region have clustered in a relatively small area, spanning West Slovakia, Eastern and Central Czech Republic, Southern Poland and Northern Hungary. The creation of this cluster was possible thanks to high levels of foreign direct investment (FDI) coming from foreign firms. Overall, the Visegrád group offered some key comparative advantages in attracting FDI:

- Favourable long-term economic prospects;
- A well-developed road and railway infrastructure;
- Proximity to large markets;
- Skilled labour force;
- Considerable wage differential and a closing productivity gap;
- Labour market flexibility;
- Access to EU markets[167].

FDI in the region has increased significantly since 1990 as a result of automotive manufacturers' strategy of focusing on expansion of production in peripheral markets. The Visegrád countries have been supporting FDI through various policies. Before their EU accession, trade policy measures such as tariffs, import bans and so forth could be used in addition to financial incentives. The Visegrád countries compete with each other for FDI from Western Europe and Asia, and after EU accession, this competition became regulated as EU rules on state aid now had to be complied with. Currently, the most important measures in attracting FDIs are financial incentives, including state aid.

The investments of the automotive industry in the Visegrád countries constitute vertical FDI[168]. The Visegrád countries attracted selected parts of the production process for export of the output

[165] Graph based on data retrieved from ACEA Historical Series 1990-2012: Passenger car registration in Europe. Available at: http://www.acea.be/news/news_detail/new_vehicle_registrations_by_manufacturer/

[166] International Trade Administration (2011). "Central and Eastern Europe Automotive Market". Available at: http://www.trade.gov/mas/manufacturing/oaai/build/groups/public/@tg_oaai/documents/webcontent/tg_oaai_003661.pdf

[167] The International Monetary Fund (2006). The Automobile Industry in Central Europe. Available at: http://www.imf.org/external/cee/2006/1106.pdf; and Werner, R. (2004). "Location, Cheap Labor and Government Incentives: A Case Study of Automotive Investment in Central Europe Since 1989". Chazen Web Journal of International Business.

to neighbouring markets.[169] The proportion of high value-added components in the four countries has been rising from 14.1% in 1996 to 32.2% in 2006, while at the same time the share of low value-added items has declined from 26.1% in 1996 to 23.3% in 2006. These numbers indicate that the Visegrád countries have become increasingly integrated in the value chain of high-tech component production. This integration has attracted more capital-intensive and skill-intensive manufacturing[170].

4.1.3 The car industry in Hungary and Slovakia

The table below provides a snapshot of the automotive industry in Hungary and Slovakia.

Table 10: Key figures on the automotive industry in Hungary and Slovakia[171]

	Hungary	Slovakia
Number of companies in automotive industry	>620	n.d.
Number of direct and indirect employees in automotive industry (2010)	>110,000	95,000
Export ratio of manufacturers	90%	>98%
Share of production value in total exports (2007)	>20%	>30%

The automotive industry in Hungary

Hungary's automotive industry is one of the key sectors in the country's economy, accounting for approximately eight and a half percent of GDP, and employing 58,806 people in the workforce[172]. According to Business Monitor International (BMI), in 2009, Hungary produced 272,127 completely built up (CBU) vehicles, down significantly from 346,055 in 2008. Sales were also down slightly to 159,704 CBUs, from 189,869 in 2008. BMI forecasts gradual decreases over the coming years in sales with a 2014 forecast of 130,621 but an increase in production to 419,550. Like its fellow CEE members, the focus is on production and export. Imports, however, are also on the rise, although this are predominately used vehicles[173].

[168] FDI can be distinguished as horizontal and vertical. Horizontal FDI relates to producing the same goods abroad as at home. Trade barriers, e.g. tariffs or transportation costs, are typically a motivation for horizontal FDI. These barriers can be overcome by moving production abroad. Vertical FDI relates to cases were only certain parts of the production are shifted abroad, e.g. because of lower production costs abroad. Accessing new markets is typically not a driver for vertical FDI. The markets abroad may also be served from production sites in the home countries in these cases. The production sites abroad might not produce complete products but only parts of complete products which are still assembled at 'home'. In these cases, value chains become fragmented across several countries. Universidade de Porto. "Foreign Direct Investment and the multinational corporation". Retrieved from: http://www.fep.up.pt/docentes/fcastro/chapter%202.pdf

[169] Werner, R. (2004). "Location, Cheap Labor and Government Incentives: A Case Study of Automotive Investment in Central Europe Since 1989". Chazen Web Journal of International Business.

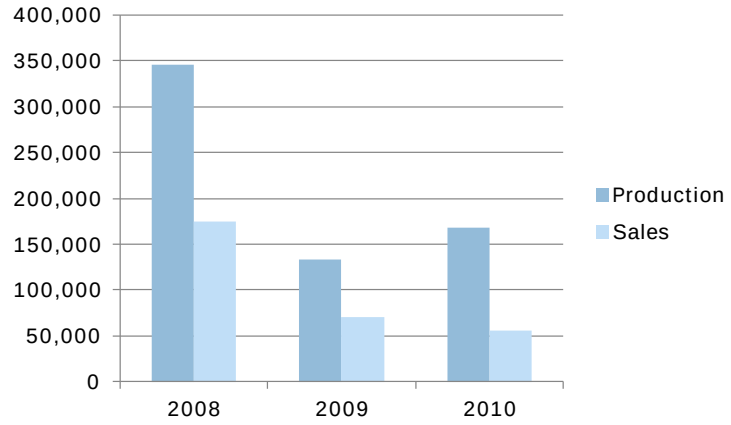
[170] Fortwengel, J. (2011). "Upgrading through Integration? The Case of the Central Eastern European Automotive Industry". Transcience Journal, Vol. 2, No 1 pp. 10 f.

[171] Sources for Hungary: Investment and Trade Development Agency Hungary (2011), The Automotive Industry in Hungary – Engine of Growth; European Automobile Manufacturers' Association (2012), Country Profile Hungary. Available at: http://www.acea.be/index.php/country_profiles/detail/hungary#text
Sources for Slovakia: Investment and Trade Development Agency (2011), Automotive Industry; European Automobile Manufacturers' Association (2012), Country Profile Slovakia. Available at: http://www.acea.be/index.php/country_profiles/detail/slovak_republic#text

[172] International Trade Administration (2011). "Central and Eastern Europe Automotive Market". Available at: http://www.trade.gov/mas/manufacturing/oaai/build/groups/public/@tg_oaai/documents/webcontent/tg_oaai_003661.pdf

[173] Ibidem.

Figure 20: Production and sales in the Hungarian automotive sector[174]

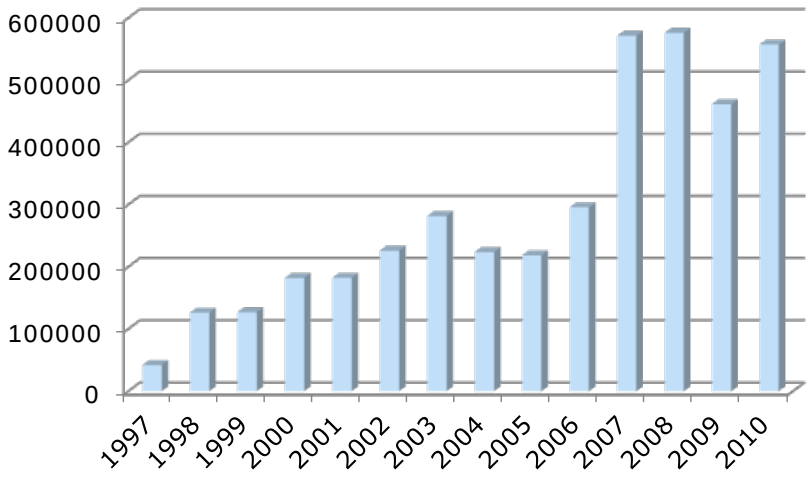


The automotive industry in Slovakia

Slovakia is also one of the leading car manufacturers in Central and Eastern Europe. It is home to Skoda and Tatra, with the sector accounting for nearly 17% of GDP and directly employing 76,000 people[175]. According to BMI, in 2009, Slovakia produced 533,306 completely built up (CBU) vehicles, down from 575,776 in 2008. Sales were also down to 97,763 CBUs, from 102,378 in 2008. BMI forecasts gradual increases over the coming years with a 2014 forecast of 116,604 for sales and 685,534 for production.

In 1990, Volkswagen was the first foreign investor, acquiring an existing plant near Bratislava. Other large investors, such as PSA Peugeot-Citroën and KIA Motors, followed later. Today, the automotive industry is one of the most important exporters and Slovakia's core industry, accounting for approximately 33% of GDP. Slovakia's light vehicle production declined by 19% in 2009, but the economy has not been as severely affected by the crisis as some other markets were[176].

Figure 21: Automotive production in Slovakia[177]



[174] Graph based on data retrieved from: International automotive industry organisation (OICA). Available at: http://oica.net/category/production-statistics/

[175] International Trade Administration (2011). "Central and Eastern Europe Automotive Market". Available at: http://www.trade.gov/mas/manufacturing/oaai/build/groups/public/@tg_oaai/documents/webcontent/tg_oaai_003661.pdf

[176] Ibidem.

[177] Graph based on data retrieved from: International automotive industry organisation (OICA). Available at: http://oica.net/category/production-statistics/

4.2 Selected sample of investment projects

4.2.1 Overview of projects

The case study on the car industry in Slovakia and Hungary consists of three investment projects: Volkswagen, Getrag Ford, and Mercedes-Benz. Volkswagen's and Getrag Ford's investments are located in Slovakia. Mercedes-Benz' investment is located in Hungary.

Table 11: Projects in the case study on the Car Industry in Slovakia and Hungary[178]

Beneficiary	Region	Instrument	Aid amount (m€, nominal)	Max. aid intensity allowed	Aid intensity awarded
Getrag Ford Transmissions Slovakia	Košický kraj (Slovakia)	Direct grant	53.5	26.0% NGE	18.1% NGE
Mercedes-Benz Manufacturing Hungary	Bács-Kiskun (Hungary)	Direct grant, Tax allowance	170.0	20.7% GGE	20.3% GGE
Volkswagen Slovakia	Bratislavský (Slovakia)	Tax allowance	14.3	4.9% GGE	4.7% GGE

Max. aid intensity allowed: Maximum aid intensity permitted by the RAG
NGE: Net Grant Equivalent; GGE: Gross Grant Equivalent

Getrag Ford: The beneficiary of the aid is Getrag Ford Transmissions Slovakia (GFTSK), a 100% affiliated company of Getrag Ford Transmissions GmbH (GFT) in Germany. Getrag Ford was founded on February, 1st 2001. It is a 50%-50% joint venture in the field of manual transmissions created from the alliance between GETRAG, a supplier of manual transmissions and drive train components, and the FORD Group.

Getrag Ford's investment in Slovakia took the form of the establishment of a whole new site in Kechnec, about 20 km south of Košice close to the Hungarian border, for the production of dual clutch automotive transmissions for automobiles and transmissions for motorcycles. The total investment amounted to €345 million, of which €265 million eligible costs according to the RAG[179].

The aid consisted of a €40 million cash grant (ad hoc aid[180]) and a €13.5 million tax exemption[181]. The aid intensity was 18.14% NGE while the maximum allowable aid intensity for large investment projects would have been 26.02% NGE[182]. The project started in 2005. This means the aid was awarded under the Regional Aid Guidelines 2000-2006 which are complemented by further specification laid down in the multi-sectoral framework (MSF 2002). First production started in 2007 and full production in 2012.

Mercedes-Benz: The beneficiary of the aid is Mercedes-Benz Manufacturing Hungary Korlátolt Felelősségű Társaság, which operates as a manufacturer for Daimler AG or its affiliated entities. Mercedes-Benz Hungary is a 100% subsidiary of Daimler AG. Daimler AG is a holding company of a group of companies which are divided into the following four worldwide divisions: Mercedes Benz Cars, Daimler Trucks, Daimler Financial Services and Vans, Buses. Daimler AG is a German stock corporation with its registered seat in Stuttgart, Germany.

[178] European Commission. State Aid Register. Available at: http://ec.europa.eu/competition/state_aid/register/

[179] Expenses eligible to regional aid are detailed in section 4.2 "Eligible expenses" of the Guidelines on National Regional Aid for 2007-2013 (2006/C 54/08).

[180] As a reminder, "ad hoc aid" opposes to regional aid granted under a multi-sectoral aid scheme which forms an integral part of a regional development strategy. It is only "exceptionally" that it is envisaged to award individual ad hoc aid to a single firm.

[181] The Slovak Republic also notified training aid in the amount of €1 million, to be granted as exempted aid pursuant to Commission Regulation (EC) N° 68/2001 on the application of Articles 87 and 88 of the EC Treaty to training aid.

[182] The difference between gross grant equivalent (GGE) and net grant equivalent (NGE) is that the gross grant equivalent is the aid element of a measure expressed before company taxes are deducted, while with net grant equivalent, all relevant company taxes have been deducted.

The aided investment took the form of the establishment of a new site. Mercedes-Benz built a new car factory in Kecskemét, a city of about 110,000 inhabitants roughly 85 kilometres south of Budapest, Hungary. The total investment amounted to around€ €930 million (nominal value) of which €548.6 million was eligible investment (nominal value). The factory has a maximum capacity of about 200,000 cars annually. It is the largest investment concerning a whole new establishment in Hungary in the past decade. The project started in September 2008; the production of vehicles started in 2012 and full completion was expected for 2013.

A total of €111.5 million in aid was allocated. The aid consisted of several elements: a direct grant on the basis of aid scheme XR47/2007, a tax allowance based on the "Development Tax Benefit" scheme, and a compensation mechanism covering possible exchange rate fluctuations (as the aid was calculated and was paid in HUF whereas most costs arise in Euros). The aid intensity is 20.34% GGE; the maximum allowable aid intensity would have been 20.74% GGE. In addition, a railway connection to the factory was built supported with around €800,000 present value.

Volkswagen: The beneficiary of the aid is Volkswagen Slovakia, a dependant undertaking owned as to 100% by Volkswagen AG. Volkswagen Slovakia (initially: Volkswagen Bratislava s.r.o.) was established in 1991. Volkswagen AG is the parent company of the Volkswagen group, with registered headquarters in Wolfsburg, Germany. Its business is divided into two divisions: the Automotive Division and the Financial Services Division. In 2008, Volkswagen purchased 49.9% of the shares of Porsche; the remaining 50.1% were bought by Volkswagen in July 2012.

The investment in scope of this evaluation concerned the diversification of an existing facility in Bratislava in order to produce a new car model called "New Small Family" model (NSF). It included an extension of the establishment, as well as a significant increase in the production capacity of the plant. The eligible costs, as defined by the RAG, amounted to €300 million. The new investment project of Volkswagen Slovakia started in 2009 and full production is foreseen to be reached in 2012 for the NSF model.

Volkswagen received €14.3 million in state aid in the form of a tax exemption. The aid was awarded within an existing investment aid scheme XR 84/2008(see also below). The aid intensity is 4.67% GGE (gross grant equivalent) while the maximum allowable aid intensity would have been 4.92% GGE.

4.2.2 Main characteristics of the projects selected

Types of investments

Getrag Ford and Mercedes-Benz's projects were initial investments in the form of new establishments while Volkswagen's investment took the form of extending an existing site. On the latter, it was argued by the Slovak authorities that the investment involves a fundamental transformation in the production process at the Bratislava plant and as such constitutes an initial investment.

Types of expenditures

In all projects, new buildings were built for the facilities. All projects include the acquisition of new production equipment as well as human investment components.

Types of activities involved

All projects were aimed at acquiring production capacities for new products. In their project, Volkswagen and Mercedes-Benz aimed to acquire production capacities for cars smaller than their typical products. This corresponds to a shift in demand from bigger to smaller and more environmental-friendly cars. The Getrag Ford project aimed to develop capacity to produce innovative dual clutch automotive transmissions.

4.2.3 State aid scheme(s) and project selection

The project's sample includes two examples of state aid under the Regional Aid Guidelines 2007-2013. Getrag Ford's investment started in 2005 and was subject to RAG 2000-2006 and MSF 2002.

4.2.3.1 Presentation of the aid schemes in Slovakia

Presentation of the aid schemes

Volkswagen was awarded aid under the existing regional aid scheme XR 84/2008[183] covered by the General Block Exemption Regulation. However, due to its exceptionally large size, the aid to Volkswagen Slovakia was notified to the European Commission for individual assessment and clearance, in accordance with the RAG[184].

Getrag Ford, on the contrary, was allocated ad hoc aid, in a sense that the investment did not benefit from an existing scheme, but was subject to a specific decision by the Slovak Government[185]. In accordance with the RAG, it was notified to the European Commission.

Both projects were handled at national level, by the Slovakian Ministry of Economy. According to the latter, priority is given investment projects that pertain to one of the following categories: 1) industrial production, 2) technology centres with high-tech products and technologies, 3) strategic service centres such as customer support centres or shared service centres and 4) investment projects involving tourism centres.

Projects evaluation

For both investments, the Slovakian authorities considered the benefits of the projects for regional development and offered aid corresponding to their cost-benefit-calculations. According to interviewees, the decision to give the aid is usually based on a cost-benefit analysis, including risk assessment and the foreseeable economic and social impacts on the sector and the region. The projects' financial and economic performance is reviewed through the calculation of standard ratios such as internal rates of return (IRR) and return of capital employed (ROCE). Whether the investor intends to make a follow-on investment in the region is an additional factor considered by the granting authority.

In each of the two investments considered an in-depth assessment was carried out by the granting authorities:

Volkswagen was awarded aid under the General Block Exemption Regulation, but pertained to the "'large investment project" category as defined by the RAG; for this reason, the Slovakian authorities had to demonstrate compatibility with the provisions for aid to large investment projects under the RAG, which entails a detailed analysis of the market share of the beneficiary before and after the investment, and on the capacity created by the investment[186].

Getrag Ford was allocated ad hoc aid outside the scope of the General Block Exemption Regulation. Hence, and for this reason the Slovakian authorities had to notify the case to the

[183] Zákon č. 561/2007 Z. z. o investičnej pomoci a o zmene a doplnení niektorých zákonov (Act No 561/2007 on investment aid and amending certain laws). It is a multi-sectoral regional investment scheme running from 01.01.2008 to 31.12.2013, with an annual budget of €34.18 million (the summary information sheet was published in OJ C 7, 13.1.2009).

[184] Section 4.3 "Aid for large investment projects" of the Guidelines on National Regional Aid for 2007-2013 (2006/C 54/08).

[185] With regard to the cash grant, the aid is based on the Slovak Act N° 231/1999 Coll. on State Aid; Section 8(2) of the Act N° 523/2004 Coll. on Budget Rules of the Public Administration; Decree N° 1/2005 of the Slovak Ministry of Economy from 1 March 2005 on the providing of grants within the competence of the Ministry of Economy; and Decision of the Slovak government N° 119 dated 9 February 2005. Concerning tax relief, the aid is based on Act N° 231/1999 Coll. on State Aid; Act N° 565/2001 Coll. on Investment Incentives, and Income Tax Act N° 366/1999 Coll.

[186] Section 4.3 "Aid for large investment projects" of the Guidelines on National Regional Aid for 2007-2013 (2006/C 54/08) stipulates that the Member States should demonstrate that "the aid beneficiary accounts for more than 25 % of the sales of the product(s) concerned on the market(s) concerned before the investment or will account for more than 25 % after the investment, or the production capacity created by the project is more than 5 % of the market measured using apparent consumption data for the product concerned, unless the average annual growth rate of its apparent consumption over the last five years is above the average annual growth rate of the European Economic Area's GDP.

European Commission. For this reason, the Slovakian authorities had to demonstrate compatibility with the provisions of the Multisectoral framework on regional aid for large investment projects (MSF)[187].

Hence, the notification to the Commission by the Slovakian authorities also included a detailed analysis of the market in which the two beneficiaries intended to operate, hence the potential impact on competition.

Aid amount and intensity level

The Slovakian Ministry of Economy has identified several priority areas where investments are expected to provide high added value and aligns the amount of aid with its development strategy. However, in accordance with the principles set out in the RAG, investments located in areas with high unemployment rates are most likely to receive a relatively higher amount of aid. This is based on this "balancing exercise" that Getrag Ford was offered an aid significantly below than the maximum ceiling permitted by the RAG (26.02% NGE instead of 18.14% NGE), but also significantly higher than the aid allocated to Volkswagen Slovakia, who invested in the more developed region of Bratislava.

If projects are not implemented as planned, the granting authority can ask for repayment. In specific cases, state aid is paid ex-post and only once the project is implemented. As can be seen in this report, this is not a general practice. In Ireland, Poland and Slovakia, the payment of the aid is conditional upon the achievement of objectives in terms of the number of jobs created, but in other case studies, one can find examples of projects for which the regional aid was fully paid even though the objectives were not fully achieved.

4.2.3.2 Presentation of the aid schemes in Hungary

The aid for Mercedes-Benz Hungary was awarded by the Hungarian Ministry of Finance in the form of a direct grant under the existing regional aid scheme XR/47 2007 covered by the General Block Exemption Regulation[188], a corporate tax allowance, and a compensation mechanism covering significant exchange rate HUF/€fluctuations). The Hungarian Authorities also notified aid in the form of an infrastructural support for railway access to the public railway network. The support was financed through the general budget of the state.

Because the project pertained to the "large investment project" category[189], the Hungarian authorities had to demonstrate compatibility with the provisions for aid to large investment projects under the RAG, which entails a detailed analysis of the market share of the beneficiary before and after the investment, and on the capacity created by the investment. To this purpose, the notification to the Commission by the Hungarian authorities also included a detailed analysis of the market in which the two beneficiaries intended to operate. On the basis of the elements provided by the Hungarian authorities, the European Commission decided that the aid was compatible with the EU Treaty.

Aid amount and intensity level

The aid awarded to Mercedes-Benz Manufacturing Hungary reaches the maximum ceiling permitted by the RAG (20.34% GGE allocated for a maximum of 20.74% GGE), and the project was allocated the highest level of aid within the whole sample of analysed projects (€170 million). Moreover, the aid consists of a high ratio of investment subsidies (i.e. cash grant) whereas the share of tax benefits is smaller (for other projects which are not regarded as beneficial or where the location competition is less intense, the Hungarian authorities would only offer lower aid intensity and aid in the form of tax benefits only).

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[187] The same provisions as those set out by Section 4.3 or the RAG (see above) applied under the Communication from the Commission (2002/C 70/04) Multisectoral framework on regional aid for large investment projects.

[188] This scheme has its current legal basis 8/2007. (I. 24.) "GKM rendelet a Kormány egyedi döntésével megítélhető támogatások nyújtásának szabályairól" (Government Decree 8/2007 (I. 24.) of the Minister of Economy and Transport on Investment Subsidies Granted by Individual Government Decision). It is a multi-sectoral regional investment scheme running from 29.01.2007 to 31.12.2013, with an annual budget of HUF 38,000 million (the summary information sheet was published in OJ C 180, 02.08.2007).

[189] As defined in paragraphs 64 and 68 of the Guidelines on national regional aid 2000-2006

The Hungarian authorities gave two reasons to explain the relatively high aid amount was offered. First, Mercedes-Benz's investment is regarded as exceptionally beneficial for the Hungarian economy: as described below, the project is expected to generate 2,500 jobs in one of the less developed region of Hungary; this is by far the largest investment project within the sample, in terms of the number of jobs created (the second largest project is Getrag Ford, with 750 new jobs planned). Second, the Hungarian authorities were also aware that Hungary was competing with other CEE locations for the investment.

4.3 Determinants of investment and location decisions

4.3.1 Determinants of investment decisions

4.3.1.1 Main determinants of investment decisions other than regional aid

Shifts in demand: According to the interviews with beneficiaries, all three investments were determined by a changing demand and the subsequent need to acquire the capacities to manufacture new products. It is true that, in addition to the consolidation and globalization trends described in introduction, the automotive industry has been marked by changes in demand. As a result of customer requirements (as well as technological innovations), the number of different car series has increased massively since the mid-90s'. Manufacturers currently enable every customer to configure an "individual" car, with an impressive range of possible combinations of optional equipment. This require more flexible production line. In addition, greater environmental consciousness has shifted demand towards greener and smaller cars[190].

For Volkswagen, a shift in demand away from large to smaller and more fuel-efficient cars led to the decision to invest in new products (so-called "New Small Family") and new production lines. At the time of data collection, the New Small Family consisted of the "VW up!", the "Škoda Citigo" and the "Seat Mii", all of which are produced in Bratislava. Likewise, Mercedes-Benz invested in a new factory to increase its production capacities to extend its compact car product spectrum.

In the Getrag Ford project, the decision to invest followed market research and detection of new demand for dual clutch automotive transmissions. Dual clutch automotive transmissions have been becoming more common since the early part of the last decade and Getrag Ford has committed to this market.

Need to increase efficiency: No interviewee mentioned efficiency seeking as a driver for investment. As explained in the introduction, the key drivers of an older "domestic" model of competition to a new "global" model in the automotive industry were that increased complexity and capital costs of assembly incentivized the automotive industry to deverticalize and shift part of their production activities to first tier suppliers. Vertically integrated assemblers have become the nodes of networks to which they outsource a wide range of tasks. In this process, the EU automotive industry, and especially the German automotive industry, has embraced CEE as its market and production location since the early 90's[191]. The analysed investments are a good illustration of this continued strategy of the German automotive industry to deverticalize.

From the analysis of the market, it is also clear that investments were part of the strategy of the German automotive manufacturers relocate some of its production activities in CEE in order to benefit from lower labour costs, especially in a context when the automotive market in Europe has been constantly slowing down over the last years. Interviews with competitors to the beneficiaries tend to confirm this hypothesis, as they mentioned the need to increase productivity as one of the main drivers of their last investment decision in CEE. It can then be assumed that, while the evolving demand and the new products in the pipeline indeed justified the investments, it was also a good opportunity to relocate production sites in low-cost locations and enhance

[190] Institute of Research on Information Systems (EBS) and iPoint-systems GmbH (2009). "Automotive Industry – Implications for Business Processes and Information Systems", White Paper.

[191] Radosevic, S.; Rozeik, A. (2005), "Foreign direct investment and restructuring in the automotive industry in Central and East Europe". UCL Centre for the study of economic and social change in Europe. Available at: http://eprints.ucl.ac.uk/17517/1/17517.pdf

overall the companies' productivity. Low labour costs were however referred to by interviewees as a location driver only (see below).

4.3.1.2 Incentive effect of the aid on the investment decision

According to the beneficiaries interviewed, the aid did not influence the investment decision in the case of Volkswagen and Mercedes-Benz. In both projects, the investments were necessary to adapt to a shift in demand. In addition, it is the opinion of the Slovakian granting authority that the aid allocated to Volkswagen was most probably not pivotal to its decision to invest, since the aid amount was relatively small compared to the total investment.

In the case of Getrag Ford, the beneficiary explained that manufacturing automotive transmissions is quite capital-intensive. Hence, the aid awarded did positively impact on the company's own assessment of potential return on investment and so did provide additional weight behind the decision to invest.

4.3.2 Determinants of location decisions

4.3.2.1 Main determinants of location decisions other than regional aid

In the Getrag Ford and Mercedes-Benz projects, the following location factors were identified:

Cost of labour*:* The low labour costs in Central and Eastern Europe (CEE) were mentioned by both beneficiaries as a key criterion in the location decision. However, this criterion was not only taken into account when deciding to invest in CEE rather than in other areas in Europe, but it was also a determinant of the location choice within Central and Eastern European Countries. For instance, Mercedes-Benz decided to locate its investment outside Hungary's automotive cluster in Central Transdanubia[192] in order to benefit from lower competition for labour force and lower wages; high-level management staff and engineers could still be hired from Budapest and brought to Kecskemét. According to Getrag Ford, the flexibility of workers and trade unions, e.g. in relation to overtime, was also important.

Availability of skilled labour force*:* The availability of a well skilled labour force was another driving factor for the two projects to establish new facilities in the selected regions. For instance, Mercedes-Benz selected Hungary instead of Romania in spite of higher wages, because of the productivity, creativity and quality of labour force, which was assessed as being higher in Hungary than in Romania at the time of making a decision. Interviewees also put particular emphasize on the proximity and quality of higher education institutions: Getrag Ford benefits from the proximity to the Technical University in Košice, while Mercedes is located close to a university of applied sciences in Kecskemét. However, Getrag Ford also acknowledges the training costs of locating in Košice, where the labour force was deemed to be less qualified than in more central areas in Slovakia.

Transport infrastructure and accessibility*:* Another important location factor was the transport infrastructure. In the Getrag Ford project, proximity to Košice airport and good road connections were mentioned. In the Mercedes-Benz project, the vicinity of Budapest (about 85 km) and Budapest airport (about 80 km) as well as the good connection via a newly built motorway and the existing railway lines were highlighted. Good highway connections were actually one of the decisive factors for Mercedes-Benz in choosing a location in Hungary rather than Poland.

In addition to the location factors mentioned above, Mercedes-Benz also stressed that the markets in Hungary and the surrounding countries have been growing faster than Mercedes' domestic market; it has also been described in the introduction chapters that since early 2000's at least, it is the new EU members from the CEE that contributed to the slow growth that there has been in the overall European automotive market. Hence, as far as Mercedes-Benz is concerned at least, the market prospects were also taken into account in the location decision, and the choice of location corresponded to a strategy consisting of producing at the periphery of

[192] Košice is located in the south-east of Slovakia around 400km away from Central Transdanubia via motorway; Kecskemét is located south of Budapest around ~200km away from Central Transdanubia via motorway.

both traditional and emerging markets. In that respect, the investor also mentioned the existence of a German- speaking minority in the area of Kecskemét as a positive location factor.

In the case of the Getrag Ford project, the interviewee mentioned that energy costs were pivotal, as the production facilities consume a lot of both gas and electricity. As part of the decision process, the company looked at the location factors over a time horizon of 30 years. For the location decision, it was assumed that the competitive advantages of the chosen location would be maintained over this period of time.

4.3.2.2 Incentive effect of the aid on the location decision

Decision mechanisms

From the evidence collected in interviews with beneficiaries and granting authorities, it appears that investors in the Automotive Industry make their decisions in a sequential way. First they decide whether to invest in CEE, second they decide in which countries within CEE, third they choose possible locations within the selected countries, and fourth they make the final location decision. For the last steps, the infrastructure and subsidies are scrutinised, and this is when granting authorities are in a position to influence investment decisions. In Hungary, for instance, the declared objective of the granting authority is to encourage companies to locate in their country, but also in areas less developed than Budapest. This approach is in line with the objectives of the RAG.

Alternative locations

According to the beneficiaries, the alternative locations to the selected region were all in CEE, for the reasons explained previously in this chapter the investments occurred within the broader context of shifting manufacturing from Western Europe to CEE in an attempt gain flexibility benefit from lower labour costs (see also background section above). In this respect, regional aid was not a decisive element in deciding whether to invest in CEE. As will be seen below, however, regional aid gave an incentive to locate in particular regions.

Getrag Ford considered the Miskolc region in Hungary (some 70 km South of Košice, on the other side of the border between Slovakia and Hungary). In accordance with the RAG, this region offered the same aid ceiling as the selected location in Kechnec (about 20 km south of Košice)[193], and regions with lower aid ceilings were not considered for the final decision. The decision between the two locations with equally high aid ceilings was in the end determined by the better availability of skilled labour at the chosen location due to the proximity to a Technical University in Košice.

Mercedes considered *inter alia* two alternative locations besides Kecskemét: Hungary's automotive cluster in Central Transdanubia and Jucu near Cluj in Romania. The reasons for not investing in Central Transdanubia were higher labour costs in this area and the fact that the maximum aid intensity, as defined by the RAG, is comparatively lower there[194]. The maximum aid intensity was equally high in Kecskemét and Cluj. The better infrastructure in Kecskemét led to the decision to invest in Kecskemét.

Incentive effect of the aid

Interviewees in both the Getrag Ford and Mercedes-Benz projects acknowledged that state aid was a determinant of the chosen location. However, state aid constitutes only one incentive influencing the company's choice of location among others.

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[193] According to the Guidelines on national regional aid for 2007-2013, the ceiling for regional investment aid in Northern Hungary (HU31 Észak-Magyarorszag, Miskolc's region) and in Eastern Slovakia (SK04 Východné Slovensko, Kechnec's region) in Slovakia was 50%.); these ceilings de not account for the adjustment that applies for large investment projects, in accordance with paragraph 67 of the RAG

[194] According to the Guidelines on national regional aid for 2007-2013, the ceiling for regional investment aid in Central Transdanubia in Hungary (HU21 - Közep-Dunantul) was 40% whereas it was 50% in Southern Great Plain in Hungary (HU33 Del-Alföld, Kecskemét's region) and in Nord-Vest in Romania (RO06, Cluj's region); these ceilings de not account for the adjustment that applies for large investment projects, in accordance with paragraph 67 of the RAG.

It is seen that early in the process, CEE countries were selected for the lower labour costs they offer; these are also the countries where maximum aid intensity ceilings are high, the aid intensity and the labour costs being highly (and negatively) correlated. Moreover, in the last decision round, both companies chose between regions with the same aid intensity ceiling. In the end, both companies invested in locations with the highest possible aid intensities.

Meanwhile, beneficiaries are also clear that they expect an aid in those countries and regions. Mercedes-Benz, for instance, claimed that without the aid they would have gone ahead with the investment, but not in Hungary. And indeed, in this case several rounds of negotiations with the granting authorities took place before the final decision was made, which is an indication that aid mattered.

In Getrag Ford's project, regional aid supported the investor's willingness to invest in Košice where the workforce appeared to be cheaper, but also less qualified than other possible locations. In this case, the aid was important to balance the risk of having to engage more heavily in capacity building in Košice. It should however be remarked that the allocated aid more than compensated for the additional training costs: In addition to the €53.5 million received under the RAG, Getrag Ford also received training aid in the amount of €1 million[195]. This, altogether, exceeds the additional training costs announced by the beneficiary (ca. €0.5 million annually).

A similar view was seen in the Mercedes-Benz project, where labour costs were the most important reasons for investing in Kecskemét rather than in the more developed Hungarian region in Central Transdanubia; in that context, state aid came in support of this approach.

From this, it can be concluded that even if the aid was not a significant driver for moving investment from more developed to less developed regions, it evidently did influence investment moving from less developed to regions within Europe with even lower levels of development.

4.4 Benefits of the investments

As can be seen in Table 12 below, the projects were proceeding as planned at the time of writing the report.

Table 12: Project status and achievements[196]

Company name	Status	Planned				Achieved			
		Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/job (k€)	Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/job (k€)
Getrag Ford Transmissions	Completed	53.5	265	750	70	53.5	265	1,200	45
Mercedes-Benz	Proceeding	170.0	688	2,500	70	170.0	688	n/a	n/a
Volkswagen	Completed	14.3	300	n/a	n/a	14.3	300	1,500	95

Aid (m€): Total aid amount in million Euro
Invest. volume (m€, nominal): Total nominal eligible investment sum in million Euro
New jobs: number of jobs created
Aid/new job (k€): Total aid amount per job created in thousand Euro
Euro equivalent calculated based on exchange rate on the date of the notification
figures in () indicate a reduction in the number of jobs at the site

[195] Granted as exempted aid pursuant to Commission Regulation (EC) N° 68/2001 on the application of Articles 87 and 88 of the EC Treaty to training aid.

[196] Source: European Commission, State Aid Register; Interviews with granting authorities and beneficiaries (June 2012)

4.4.1 Effects on direct jobs

Gross change in direct jobs:
As shown above, a large number of jobs were created as a result of both investments. The number of jobs created in these projects exceeds by far the average number of jobs created per project across all the industry case studies.

According to the information provided by the beneficiaries, Getrag Ford originally planned to create 785 new direct jobs and claims to have achieved around 900 in 2010 and 1,200 at the time of the interview in 2012, in spite of difficulties in finding employees with the required qualifications. According to the beneficiary, more than 80% of the employees live within a 50 km radius of the investment site. Only a small number of people of up to 5% were brought to the region as expatriates.

In the case of Mercedes-Benz, the investment was continuing as planned at the time of writing this report, and about 2,500 new jobs are expected, which corresponds to ca. 5% of the total labour force in Kecskemét[197].

Quality of jobs and training
No evidence could be collected on the effect of the investment in terms of the quality of jobs. Getrag Ford deemed that it has to invest heavily on training the local labour force. This is one the additional costs of locating the investment in Košice, where the labour force is less qualified than in more central areas in Slovakia. The data provided by Getrag Ford indicates that the firm is intending to spend ca. €500,000 on training the new labour force annually. Divided by the 1,200 new hires, this is a relatively low investment compared to what can be found in the whole sample of 28 projects, but this is also quite close to the average level found in the case of the internal business services in Poland, which in principle involve a work force with a higher educational level.

4.4.2 Indirect effect on jobs and additional demand in the regions

More detailed information on additional demand in the region as a result of the investment could be collected for Getrag Ford only.

Indirect effect of the investment phase
According to the beneficiary, only a small share of the investment sum was spent on suppliers within a 50 km radius of the Getrag Ford investment site during the investment phase.

Indirect effect of the operating phase
In the medium term, Getrag Ford expects €400 million of additional turnover as a result of the investment project. About 3.5% (€15 million) of this additional turnover is expected to be spent on service *suppliers* (only) within a 50 km radius of the site. The beneficiary also estimates that the investment created about 500 indirect jobs in the region. All suppliers in the region are new suppliers, i.e. they were not in a business relationship with Getrag Ford before the investment.

The company's clients are located mostly in Germany, the USA and Japan. Hence the investment had no impact on the *client base* locally.

4.4.3 Other effects

Cooperation with higher education institutions: In Getrag Ford and Mercedes-Benz projects, it was possible to identify evidence of knowledge transfer, in close cooperation with local universities. Getrag Ford implemented training programmes in cooperation with the local Technical University and contributed to qualification of the workforce in the region. Getrag Ford has been spending €500,000 annually on training for the new local workforce, which is said to be a large investment in human capital for the company. According to Getrag Ford it took around three to four years before the workforce was able to meet the quality and productivity standards necessary to be competitive on a global market.

[197] It is expected that no more than 5% of the new hires will be brought to the region as 'expatriates'.

According to interviewees, Mercedes-Benz's investment is also expected to generate knowledge transfer to the region since "state-of-the-art technology" will be used in the new facilities. At the time of the interview, Mercedes-Benz had already concluded two strategic partnerships with local institutions: the local university of applied sciences and the local chamber of commerce. The aim of the partnership with the local chamber of commerce is to replicate the German system of dual vocational training ("Duale Berufsausbildung"), which combines training at school and at the workplace[198].

Spill over effect: Significant spill over effects can be observed in both Getrag Ford and Mercedes Benz projects. Getrag Ford was one of the first investors to locate in the new industrial park of Košice. Getrag Ford's investment helped the park to its activities and in a very short period of time after Getrag Ford's decision, 15 other companies from different sectors decided to establish in this park. The local Technical University also benefits from Getrag Ford's presence, as the company supplies equipment for the training of students, and offers internships and study opportunities.

The Mercedes-Benz investment in Hungary is huge, and it is estimated that the investment project will contribute to the national Hungarian GDP by approximately 0.4%[199]. Hence, it is expected that the investment will stimulate other regional economic activities, in particular the construction and building industry. An increase in real estate prices in Kecskemét of about 30-50% was already evident at the time of the interview. The granting authority furthermore points out that Mercedes is a well recognized brand and that the investment has a positive reputational effect for Hungary and might help attracting additional foreign investment.

4.5 Impact on competition and other regions

4.5.1 Impact on competition

This section analyses the potential negative effect of the state aid on competition in terms of crowding out effect, through inefficient market structures or market concentration. The main characteristics that are relevant in such an analysis are the market shares the companies hold, the barriers to entry into the market, the conditions of the market itself in Europe and the potential situation of overcapacity that affects it.

4.5.1.1 Potential distortions due to market inefficiencies

In a situation of *overcapacity* of production, any increase in production capacity through investment can be seen as contributing to the maintenance of such inefficiency and thus be considered potentially harmful for the economy. However, making such an assessment is often problematic not least since the potential increase in production of a final output like a car, depends also on the capacity of the value chain to keep the pace and produce as many components as needed. Since this additional supplying capacity is difficult to measure and to integrate into the assessment process, the impact of additional production capacities needs to account for this limit.

Urban Small Cars (Volkswagen AG)

As stated above, the Bratislavský industrial facility is intended to produce the NSF (New Small Family) model. This falls into the category of the Urban Small Cars A00 category in a range going from A000 to E[200].

To analyse the potential impact of the plant on the *market efficiency*, the market trends for both the global automotive market and the sector considered are analysed. The economic crisis that hit the world's economy in 2007-2008 had an evident effect on the level of car sales, which

[198] Mercedes-Benz. Mercedes-Benz, Stadt Kecskemét und IHK des Komitats Bács-Kiskun vereinbaren strategische Partnerschaft. Available at: http://wwww.mercedes-benz.hu/nachrichten/127.

[199] European Commission (2005). State aid N 158/2005 GETRAG FORD Transmissions Slovakia (MSF 2002).

[200] In its Decision C(2009)9312 on State aid N 674/2008, the Commission endorses the classification proposed by the Slovak authorities

appears to be procyclical and varies with GDP. As context one can note that the level of sales abruptly fell in the European market and does not show any sign of recovery. Market forecasts for 2013 expect light-vehicle demand in western European will decline 3%, compared with its prior view for 3% growth, amid weaker markets in Southern Europe, especially Italy[201]. For the same period, the GDP of the EU is expected to slow down at a near to 1% growth[202].

Figure 22: New Passenger Car Registrations in the EU and GDP (1990-2011)[203]

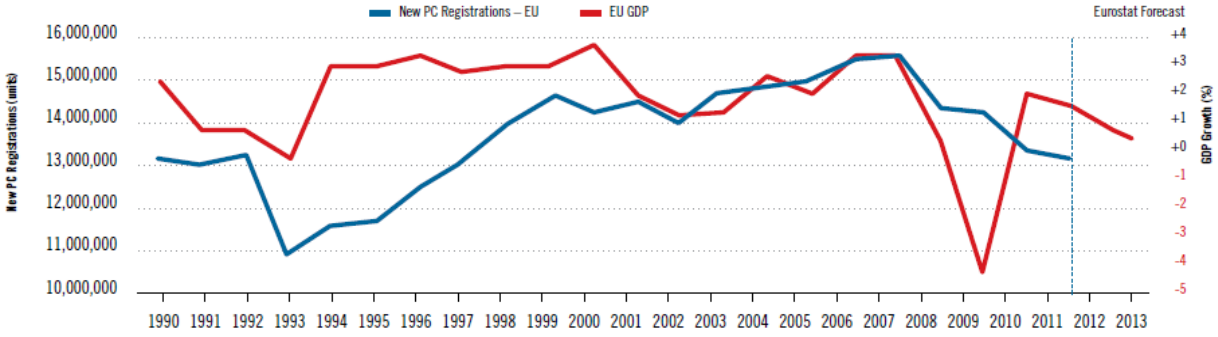
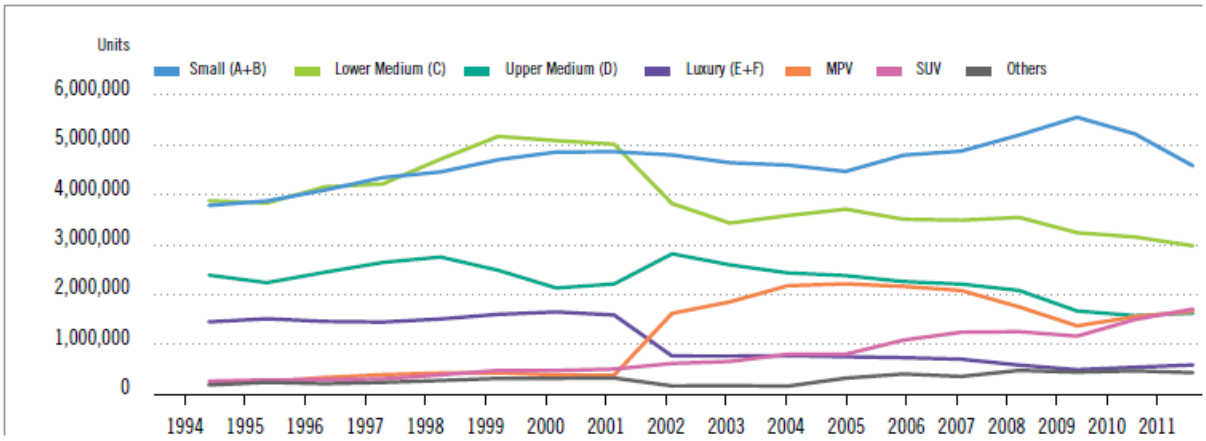


Figure 23: New cars sold in Europe by Segment[204]



Following the Commission's approach, the situation of the market is then that of an absolute declining market. Even the figures for the sector concerned confirm that, albeit keeping the strongest share, the urban cars registration for 2012 will be lower than five million units, in line with the decreasing trend of the 2009-2011 period[205].

In the case of Volkswagen, the question is then to understand the impact of an increase in production capacities in the A sector by 200.000-300.000 units in a market that passed from six and a half million cars sold in Europe to less than five million. Since we stated that the market is in a situation of overcapacity[206], the expected increase in production may prove problematic as regard to market efficiency.

[201] The Wall Street Journal (2012). "Moody's Lowers Growth Forecast for 2013 Global Auto Sales", Available at: http://online.wsj.com/article/BT-CO-20120917-706701.html

[202] European Commission (2012). "Spring forecast: towards a slow recovery. Available at": http://ec.europa.eu/news/economy/120511_en.htm

[203] ACEA (2012). ACEA Pocket Guide 2012. Available at: http://www.acea.be/images/uploads/files/ACEA_POCKET_GUIDE_2012_UPDATED.pdf, p. 58

[204] Ibidem, p. 59.

[205] Ibidem.

[206] Again sticking to the Commission's approach about the effects of underperformance in the market considered: if the markets slow down, there is overproduction compared to the market potential of absorption.

Compact Cars (Mercedes-Benz)
The car factory in Kecskemét is designed to produce C category vehicles of the models Class A and Class B. Compact vehicles are also labelled as Lower Medium size. The width of the market considered is disputable since the Class B model is often cited as a Multi-Purpose Vehicle (MPV) that can compete with some other models listed in the C and D sectors.

Most of the considerations made on the global car market in the above paragraphs apply also to this sector. For what concerns the sectors considered in this section, the sales trend for the C sector has been decreasing since the beginning of the last decade, with a slump after 2008 which subsequently stabilized. This market is thought to absorb approximately 1.6 million cars in 2012 and to maintain this level in 2013[207]. However, during the same period, the MPV sector has been growing significantly and, following a slowdown after 2008, it has managed to overtake the sale level of the C sector, absorbing a little under 1.7 million cars[208]. The problem arising here is the mixed behaviour of the global market considered, with a decreasing C sector and an increasing MPV sector. Overall the trends suggest that the market is not performing well and may not be growing more than the GDP, but since the picture is blurred, we may doubt whether considering it a market in relative decline or not.

In this uncertain situation it is worth conducting the market impact test. The full additional capacity provided by the plant is of 200.000 units that represents an overall increase of more than six percent[209] of the market concerned (sector C plus sector MPV). Moreover, it increased the productive capacity of Mercedes-Benz itself by more than 25%[210], selling almost 800.000 cars in 2011. These are two elements that are likely to reinforce the perception of a market distortion. Additional concerns can be raised taking into account the possibility of using the chassis of the Class A and Class B models to build other cars for other sectors. This may imply a further analysis of the possible impact on the market, given its generally negative trends

Nevertheless, the characteristic of being premium cars may contradict this first assessment. After the 2008 crisis, the car market has experienced a strong divide between the premium brands and others. The former have been performing better, with growing sales even in the suffering European market[211]. Even if this division may not be enough to exclude any potential distortive effect, it must be taken into account. This other target market, defined by the perceived quality of the brand and not by the size of the car, is growing and Mercedes-Benz posted a slightly increase in its sales during last year with a growing market share[212]. That is why the distortive effect that can be stated considering the usual segmentation of the car market may not completely be supported by evidence when considering other factors in defining the market than model type.

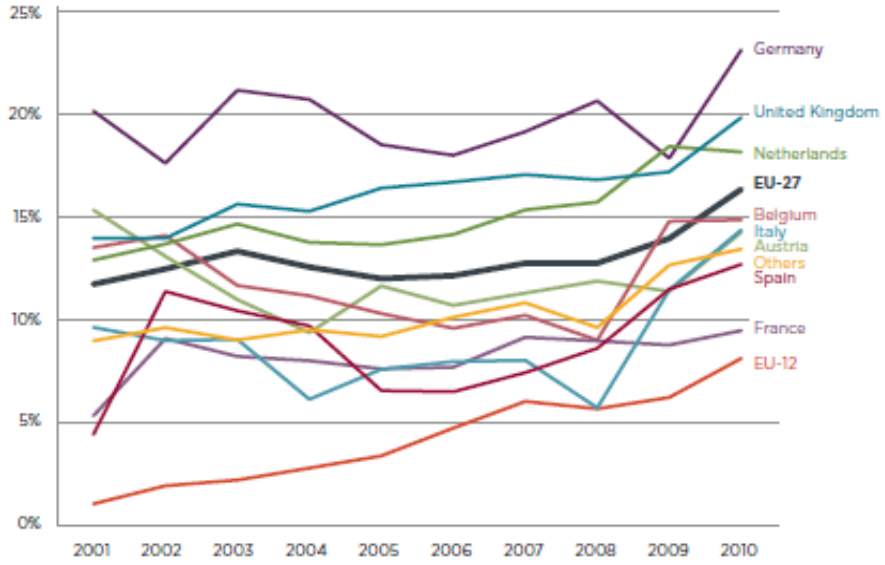
Transmissions (GETRAG)
Automatic transmissions, of which the dual clutch transmissions produced in the Košice plant are part of, is a key component of both two and four wheels vehicles. Therefore the *market trend* for these products is usually following the market trend for the automotive market[213]. Lacking of precise data on the CVT transmission in Europe, the considerations made for the automotive market are then a good proxy of those that could be done for the CVT market. We should

[207] ACEA (2012). ACEA Pocket Guide 2012. Available at:
http://www.acea.be/images/uploads/files/ACEA_POCKET_GUIDE_2012_UPDATED.pdf
[208] Ibidem.
[209] 200.000 more units in a market that at best could be 3.300.000 unit worth.
[210] Retrieved from the ACEA database. Available at:
http://www.acea.be/news/news_detail/new_vehicle_registrations_by_manufacturer/
[211] The Economist. (2012)"Too many cars, too few buyers. Luxury cars are speeding ahead; lesser brands are stalled". Available at:
http://www.economist.com/node/21547788
[212] Retrieved from the ACEA database. Available at:
http://www.acea.be/news/news_detail/new_vehicle_registrations_by_manufacturer/
[213] " Global Automotive Transmission Systems Market to Reach 94 Million Units by 2017, According to the "New Report" by Global Industry Analysts, Inc. Available at:
http://www.prweb.com/releases/manual_transmissions/automatic_transmissions/prweb9406179.htm

moreover consider that the products of the plant are mainly sold in a European market, according to what the Slovak authorities declared[214].

However, as shown in the graph below, the share of vehicles sold with the CVT transmission has been growing over the last year, hence the sector has been performing better than the overall automotive industry in the EU. Since the trend is definitely positive and outpacing the growth of the EEA area for the period concerned, the market cannot be deemed as declining and an increase in the *productive capacity* is not to be seen as potentially distortive.

Figure 24: Market share of vehicles with automatic transmission by Member States[215]



4.5.1.2 Potential distortion due to excessive market power

In general, any aid to one beneficiary in a *concentrated market* is more likely to distort competition, since the decision of each firm is likely to affect its competitors in a more direct manner. This is especially the case if a dominant market player is subsidized. This section examines if state aid was allocated to companies with *market power*.

Urban Small Cars (Volkswagen AG)

Volkswagen is one of the top ten car-making groups and one of the only heavily investing ("It plans to spend €76 billion on new models and new factories by 2016. Its global workforce is more than half a million, and growing")[216].

In 2011 it produced over 8.5 million vehicles in all the sectors, which is far from reaching the critical 25% threshold set in the RAG, since it constitutes nearly the 14% of the almost 60 millions of cars produce in the world in 2011[217]. However in Europe, the share is significantly higher, accounting for nearly 25% of the market in the first quarter of 2012[218]. Figures in 2011 show how the market share is of Volkswagen in the European market accounted for almost the same percentage (keeping in mind that in 2011 the registered cars in Europe were 13.6 million[219], the market share is of 21.6%[220]):

[214] Decision C(2009)9312 on State aid N 674/2008

[215] ICCT (2011). European Vehicle Market Statistics. Available at: http://www.theicct.org/sites/default/files/publications/Pocketbook_LowRes_withNotes-1.pdf, p.20

[216] The Economist (2012). " VW conquers the world. Germany's biggest carmaker is leaving rivals in the dust". Available at: http://www.economist.com/node/21558269ttp://www.economist.com/node/21558269

[217] http://www.worldometers.info/cars/

[218] Wall Street Journal. (2012). "Volkswagen grows in Europe as the car market shrinks". The Available at: http://online.wsj.com/article/SB10000872396390444812704577609121281323292.html

[219] Retrieved from the ACEA database. Available at: http://www.acea.be/news/news_detail/new_vehicle_registrations_by_manufacturer/

[220] Calculated retrieving the global level of sales from ACEA and the VW sales from the VW website.

Table 13 Volkswagen sales in the EU [221]

	2010		2011	
	Total Volume	Market Share %	Total Volume	Market Share %
Audi	627,100	4.0%	681,525	4.4%
SEAT	303,902	1.9%	307,272	2.0%
Skoda	471,453	3.0%	497,925	3.2%
Volkswagen	1,717,487	11.0%	1,891,117	12.1%
Others	1,988	0.0%	2,121	0.0%
Total	**3,121,930**	**20.0%**	**3,379,960**	**21.6%**

This is of course important when assessing the level of *market power* hold by Volkswagen in Europe, especially considering the situation of decline of this market over the past years compared with the growing productive capacity of this company. Moreover, the new plant will enable Volkswagen to increase its potential production of nearly 10% if the cars were to be absorbed within the European market.

Overall, the *market share* that Volkswagen has reached in the European market is high and potentially a source of concern for regulator. The fact that the company is growing also expanding outside Europe, with a strategic growth plan that relies on the expansion of its capacity, can contribute to lower the level of concern for its European strength. However, over the next period and in a situation of *market consolidation*, the position of the biggest European car producer is likely to become an important issue for the competitiveness of automotive sector in the common market with the role of aided investment becoming of increasing importance.

Compact Cars (Mercedes-Benz)
Daimler AG is a premium car producer that holds a 5.7% *market share* in the European market. Mercedes-Benz constitutes the strongest brand holding a 5.2% share in the C, D and E sectors[222].The entity of such market share in Europe may not justify concerns, since it is far from hitting the 25% threshold required by the Commission's criteria.

Mercedes-Benz is also perceived as a premium brand. Under this perspective, the cars it produces compete not on size, but on the reputation of quality and luxury that the brand embodies. This is why the market share cited above is probably not completely relevant. Not all the players in the market are competitors since not all of them offer premium cars. Those who do compete under the premium category are BMW and Audi (which is property of VW). Since the number of companies competing is lower, the market shares of this sector are higher than those concerning the general automotive market in Europe. This is why some concerns on an increase in market power could be raised. Nevertheless, such an approach is highly problematic because it requires a clear definition of a premium sector.

Transmissions (GETRAG)
Precise data on the market share that GETRAG holds in the EEA market are not available either, and the estimates provided by the Commission[223] in 2009 are the only ones on which to rely. The potential market share was to reach the [20-25]% of the EEA market in 2013 thus potentially raising concerns on excessive market power. Moreover, the company declared further investments in the Košice plant to extend its market share[224].

[221] Table based on data retrieved from: International automotive industry organisation (OICA). Available at: http://oica.net/category/production-statistics/
[222] Retrieved from the ACEA database. Available at: http://www.acea.be/news/news_detail/new_vehicle_registrations_by_manufacturer/
[223] Decision C(2009)9312 on State aid State aid N 158/2005
[224] Wards Auto (2012). "Getrag-Ford boost dual clutch transmission capacity in Slovakia". Available at: http://wardsauto.com/suppliers/getrag-ford-boost-dual-clutch-transmission-capacity-slovakia-expand-rd-operations

4.5.1.3 Effects of aid for competitors

As has been stated since above, both the impact of the aided investment on the *market efficiency* and *market power* is a source of concern in the case of Volkswagen with an indication that a number of the conditions for the aid to have a negative impact on competition being present. However, one should keep in mind that the aid amount allocated to the project is comparatively modest (€14.3 million) when compared to that of the other two projects and to the financial capacity of the company, and for this reason, it is not possible to definitively conclude on this project.

Market power is not a source of concern in the case of Mercedes Benz, but the size of the financial support (€170 million, 20.34 GGE) calls for carefulness. In this respect, the *additional capacity* added to the market, which is declining overall, but also on the market segments concerned, whose behaviour is contrasted, can be seen as distortive, even with all the caveats in mind.

Given the relatively *dominant position* of Getrag on the car transmission market, as well as the amount of aid allocated, the investment could be a source of concern as regard to its potential negative impact on competition. However, available evidence and data are not sufficient to conclude on the potential distortion arising from the aided investment, especially as the market does not seem to be inefficient.

None of the competitors interviewed noticed *any market distorting* effect that could be attributed to *state aid* as such[225]. Interviewees did not consider subsidies to distort competition because they are equally accessible to all market participants, and that procedures are transparent. That said it should be noted that all competitors are actual or potential beneficiaries of state aid, and as such may have limited incentive to make comment that could lead to such aid being withdrawn or reduced.

4.5.2 Impact on other regions

This case study deals with investments where the cost of labour was an important factor, hence the decision to locate the investment in Central and Eastern Europe. One could envisage potentially negative impacts of such investment on other regions in Europe.

Urban Small Cars (Volkswagen AG)

In the case of Volkswagen, a strategy of delocalization could hinder hypothetical investment decisions in existing plants, especially in Germany. However, data disclosed from the group show**s** that the employment levels in both Germany and the other countries kept on rising over the last few years[226]. Whilst more unpacked data, for instance concerning the job quality and its distribution over the plants, could be a better indicator generally speaking, there is no evidence that the investment considered had any harmful effect on any other Volkswagen plant.

Compact Cars (Mercedes-Benz)

Employment figures of Daimler AG are not disclosed, however the management agreed during the post 2008 downturn to lower the labour cost without cutting jobs in the existing plants. Costs saving measures were mainly directed towards a reduction of the benefits for the employees at every level[227], which impacts on the quality of the jobs offered by the employer. In a situation requiring efficiency gains, the opening of a new plant in an area with lower labour costs and corporate tax rates is in line with any labour cost reduction strategy. However, since the decision was prior the financial crisis, it can reasonably be assumed that an investment in new productive

[225] To assess potential impact on competition representatives of Toyota/Lexus, Daimler, Opel/Vauxhall and Renault were interviewed. A total of 15 potential competitors were contacted.

[226] From 2006 to 2011, the number of employees in the group rose by 33% in Germany and 78% in other countries. Volkswagen AG Facts and Figures Navigator 2012. Available at: http://www.volkswagenag.com/content/vwcorp/info_center/en/publications/2012/03/navigator-2012---facts-and-figures.bin.html/binarystorageitem/file/Navigator_21_09_2012_en_WEB.pdf

[227] http://www.daimler.com/dccom/0-5-7171-1-1203507-1-0-0-0-0-0-9296-7164-0-0-0-0-0-0-0.html

capacity at that time may just have worsened the pressure on labour costs in the existing plants and contributed to those costs saving measures.

When interviewed, the beneficiary considered that the investment in Hungary has contributed to safeguarding jobs in Germany. The models to be assembled in Hungary have so far been produced only in Rastatt, Baden-Württemberg, Germany. As demand has been growing for the relevant models, Mercedes-Benz has been investing not only in the new factory in Hungary but also in the existing production lines in Germany. In addition, it is the beneficiary's view that the new location in Hungary helps to improve Mercedes-Benz's competitiveness overall, and hence contributes to securing existing jobs in Germany[228].

Transmissions (GETRAG)
In the Getrag Ford project, the investment led to the relocation of existing production activities from Neuenstein, Hesse, Germany. One hundred jobs were directly impacted by the investment but, according to the beneficiary, the employees were retooled for another car transmission line in Neuenstein. The net effect of this transfer could not be assessed. The nature of the project cited above, that is meant to enlarge an existing plant, together with the data on the rising market for the CVT transmissions in Europe, can be interpreted as signals of a balanced growth strategy that should not impact negatively other regions while increasing the potential of the Slovak plant.

Effects of aid for other regions
Although it has been clearly stated that the aid had some incentive effect for the location decisions, there is little evidence of the negative impact of the investments on trade. The effects of the investments in CEE on employment in the investors' home countries have been debated. On the one hand, it has been argued that every job created in CEE as a job lost in Western Europe. This implies that jobs are transferred to CEE due to lower labour costs and financial incentives by CEE countries. On the other hand, investing in CEE makes Western European car manufacturers more competitive vis-à-vis non-European competitors. Thus, the shift of lower-value manufacturing jobs to CEE may help to save and create other higher-value jobs in Western Europe while destroying lower-value jobs in Western Europe at the same time[229].

4.6 Conclusion

The following section provides an overall summary of findings relating to the the case study on the Automotive Industry in Slovakia and Hungary.

Determinants of investment or location decisions of the aided firms
The investment projects analysed in this case study reflect very well the trends observed in the automotive sector, which have been marked by globalisation, consolidation (a decline in the number of car registrations in the EU can be observed), as well as structural changes in the value chain structure. Decisions to deverticalize have been driven by the need to seek cost optimization in a context of enhanced competition at global level, increasing regulation in the sector, and in particular in the EU (e.g. in terms of the environment and safety), increasing demand for more efficient and greener cars, and the individualisation of car models (i.e. through increasing combinations of optional equipment). In this context, the automotive industry has in recent years undertaken significant investment in new and flexible production units in Central and Eastern Europe (CEE) and the case study projects reflect the strategy of the automotive industry in the EU. On this basis it can be said that the aid beneficiaries had strong incentives to invest in CEE and to seek state aid.

The availability of regional aid is likely to have provided a level of incentive for the in initial decision to investment. From the interviews, it appears that the availability of state aid was a significant factor in the thinking behind one of the three investment projects analysed (Getrag Ford). In the assessment of the beneficiary, the aid had an impact on the company's own

[228] cf. Budapester Zeitung, „Meilenstein für Ungarn", http://www.budapester.hu/2009/10/meilenstein-fur-ungarn/

[229] Nonnenkamp (2006). "Relocation, offshoring and labour market repercussions: the case of the German automobile industry in Central Europe". Available at: http://hdl.handle.net/10419/3910

assessment of the potential return on investment and so did provide additional weight behind the decision to invest (especially at a sufficiently large scale to generate economies). With regard to the other two projects, there is insufficient evidence to draw a similar conclusion, although it can be assumed that the same considerations applied in the case of Mercedes Benz where the size of financial support amounted to €170 million or 20.34 GGE. That said there was inconclusive evidence from stakeholder interviews as to whether the investment would have occurred without the aid.

Regional aid provided a strong incentive effect for the location decisions. Due to their lower labour costs, only locations in CEE were considered by the investors. State aid impacted the specific choices of regions within the CEE countries. Investors valued that the least developed regions offered the highest aid intensity ceiling according to the RAG. The state aid compensated for the risks of investing in the least developed regions (e.g. additional recruitment and training costs). However, low labour costs,[230] good transport infrastructure and a quality labour force were also very influential variables in relation to choice of location. Thus, it can be concluded that state aid contributed to attracting investment to the least developed regions, which would have otherwise been made in eligible but comparably better developed regions within CEE.

Consequences of the investments in terms of regional and employment benefits and externalities

The investment projects appear to be highly beneficial to the regions where they took place, especially in terms of direct jobs: the investment projects analysed are among the largest in terms of the number of jobs created within the whole sample. In addition, some evidence was collected of knowledge transfers involving local training and educational institutions. Finally, some spill-over effects can already been observed as the large investments by the beneficiaries helped attract additional foreign investment to the region, with more expected in the future.

In the light of the projects analysed, the general conclusion is that the aid for the car industry in Slovakia and Hungary was effective and efficient for the granting authorities. Although CEE regions offered competitive advantages in terms of low labour costs compared to more developed regions in the EU, regional aid did influence regional location decisions, which in turn helped the countries to broaden economic development out from the main urban centres. Moreover, investments have been or are expected to be highly beneficial for the relevant regions.

However, as far as Getrag Ford and Mercedes-Benz are concerned, these positive conclusions need to be set against the fact that, regardless of the aid, lower labour costs at the periphery already provided a strong incentive for the firms to locate their new establishments away from the most developed regions. Regional aid was said to compensate for the risks pertaining to those peripheral locations and indeed, Getrag Ford encountered difficulties in recruiting, which induced higher capacity-building costs. According to the data provided by the beneficiary, however, these additional costs were much lower than the allocated aid. Hence, whether lower permitted ceilings would have been appropriate remains an open question.

In the case of Mercedes Benz, the maximum permitted level of state aid was awarded after several rounds of negotiations with the beneficiary. The beneficiary appeared to be quite confident that the company's large investment would be supported by public expenditure, and for this remarkably large project (2,500 jobs to be created), one can postulate that if no EU rules on maximum aid intensities had existed, even higher aid might have been offered.

The distortive effects of aid for competitors and/or other regions

The analysis shows that, in this particular case study, the aided investments are a potential source of negative effects on the creation of market power and the creation or maintenance of inefficient market structures. Regarding market power, the aid allocated to Volkswagen is the main source of concern, as the company reached more than 25% market share in 2011 while full production was not reached yet on the new site near Bratislava. Regarding market structures, the

[230] It should be reminded that the level of unemployment is negatively correlated to the GDP; mechanically, wages are negatively correlated to the aid intensity ceiling set in the RAG. For this reason, regional aid adds up to lower labor costs in the decision to invest in less developed regions.

aided investments occurred on a declining market, and the capacities added, above five percent in all projects, might be regarded as a source of inefficiency; this is particularly the case of Volkswagen and Mercedes Benz, although available data does not allow for a definitive conclusion to be drawn. These problems were anticipated at the time of the decision to give aid to the investors, since all analysed aid cases were notified to the Commission. Nonetheless, all the investment projects were deemed compatible with the RAG.

It is of note that one of the competitors interviewed claimed that Volkswagen's investment had in fact slightly lowered their company's turnover and profitability, while prices were left unaffected. However, the interviewee stressed that any competitor's investment increases competition by adding capacity to the market. This is especially the case of "Volkswagen Up!", which targets the same group of customers as that of the competitor that was interviewed. The response of the competitor to evolving competition was to reduce its level of production, but without affecting employment levels. However the interviewee did not link this to any market distorting effect of *state aid*, which confirms the beneficiary's statement, according to which the aid did not have any impact on the decision to invest.

This case study deals with investments where the cost of labour was an important location factor, hence the decision to locate the investment in Central and Eastern Europe. However, contrary to what could have been expected, there is little evidence of the negative impact of such investment on trade. On the contrary, the shift of lower-value manufacturing jobs to CEE may in fact have helped to product or even increase higher-value jobs in Germany.

5. INTERNAL BUSINESS SERVICES – POLAND

This fourth case study looks at internal business services in Poland. It builds on a selection of eight investment projects.

5.1 Background

This first section defines the so-called "Internal Business Services" market, illustrates its main characteristics alongside a discussion of broader global trends. The chapter goes onto set out the development of this sector in Eastern and Central Europe, to introduce in a subsection the trends and developments in Poland, where the projects considered are located.

5.1.1 Introduction to Internal Business Services

"Internal Business Services" – also called "the business service sector" – refers to the offshoring of business services. This is not a sector as such, but the result of a business strategy that has developed rapidly since the early 1990s in Europe. According to the OECD, "offshoring is used to describe a business's (or a government's) decision to replace domestically supplied service functions with imported services produced offshore"[231]. Offshoring is a business's sourcing decision, which potentially covers a large range of functions including computer programming, payroll and accounting, and customer call centres. If the activity was relocated to a country from within the same part of the world (e.g. within Europe), the term "nearshoring" can be used. Relocating the servicing of selected business processes to other locations within the same state is known as "onshoring"[232].

The "Internal Business Services" encompass[233]:

- **Business Process Outsourcing Centres (BPOs):** specialised companies or their units taking over the provision of selected, non-operational business processes, *commissioned by other enterprises*. This category also includes IT outsourcing (ITO).
- **Shared Service Centres (SSCs):** detached service units of other companies or individual economic entities, *working for their parent companies* and their units, servicing commissioned business processes.
- **Research and Development Centres**: specialised companies conducting research and development work commissioned by other enterprises, or detached units of enterprises, active in the sphere of R&D. Application of a broad definition of R&D activities means this category also covers technical-engineering centres, as well as software development centres.

[231] OECD (2004), "Glossary of statistical terms: Offshoring", http://stats.oecd.org/glossary/detail.asp?ID=6271. Based on United States Government Accountability Office 2004, "International Trade – Current Government Data Provide Limited Insight into Offshoring of Services, Appendix II", Washington DC.

[232] Jones Lang LaSalle (2011). "Onshore, Nearshore, Offshore: Unsure? A 2011 Central & Eastern European Perspective".

[233] Association of Business Service Leaders in Poland (2012). "Business Services Sector in Poland". This report is used as the main source of information in this section. Available at: http://www.absl2012.epublish24.com/ABSL/assets/downloads/files/ABSL_2012.pdf

Recent improvements in communication technology have helped companies to move services across country borders and led to a dramatic increase in the ability to source production from anywhere in the world. The fall in the relative prices of services in the information, communication and technology sector and the liberalisation of trade have facilitated the spatial fragmentation of value chains alongside service functions. Advances in this process have made it easier for companies to disaggregate their value chain around the globe. Contrary to earlier stages of globalisation when specialisation required geographic concentration, the process of offshoring business services is distributed among numerous supplier firms in distant locations. The offshoring process encourages the specialisation by function rather than by sector.

In this process, new countries, such as Ireland and India, emerged as leading locations for services to be offshored. However, during the 1990s and early 2000s Central and Eastern European countries (CEE) have also become important locations[234] .EU imports of IT-based services from CEE countries rose by an average of 13% per year between 1992 and 2004. Imports from India, by comparison, increased only slightly faster than those from the CEE during the same period (average annual 14%increase), despite the considerable lower wages in India. A common cultural background of providers and clients is particularly important for more complex business processes. Clients from outside English-speaking countries appreciate the widespread language skills in CEE. This outweighs the relatively lower IT specialisation in CEE compared to countries such as India and Ireland. Moreover the IT specialisation is often less significant for many of the typical back-office processes these services cover (e.g. accounting services, market research, etc.)[235]. Although India still clearly leads the global offshore business services market with a roughly 40% market share, the region of Central and Eastern Europe is still growing, holding a 7 to 8% share as of 2012[236].

5.1.2 Internal Business Services in Poland

According to the 2011 report of the Association of Business Service Leaders in Poland (ABSL), the business service sector has been growing rapidly in Poland since the middle of the last decade, largely as a consequence of increased foreign investment boosted by Polish accession to the EU. The first investors arrived in the 1990s but the most outstanding growth took place in the last few years. For instance, the number of centres established in Poland increased by 250%between 2004 and 2010 (average 23% per year). By the end of 2010, there were 282 service centres with foreign capital active in Poland, employing 69,000 persons. The prevailing majority were Business Process Outsourcing centres (BPOs) and Shared Service Centres (SSCs) (82% of employment in the sector in 2010).

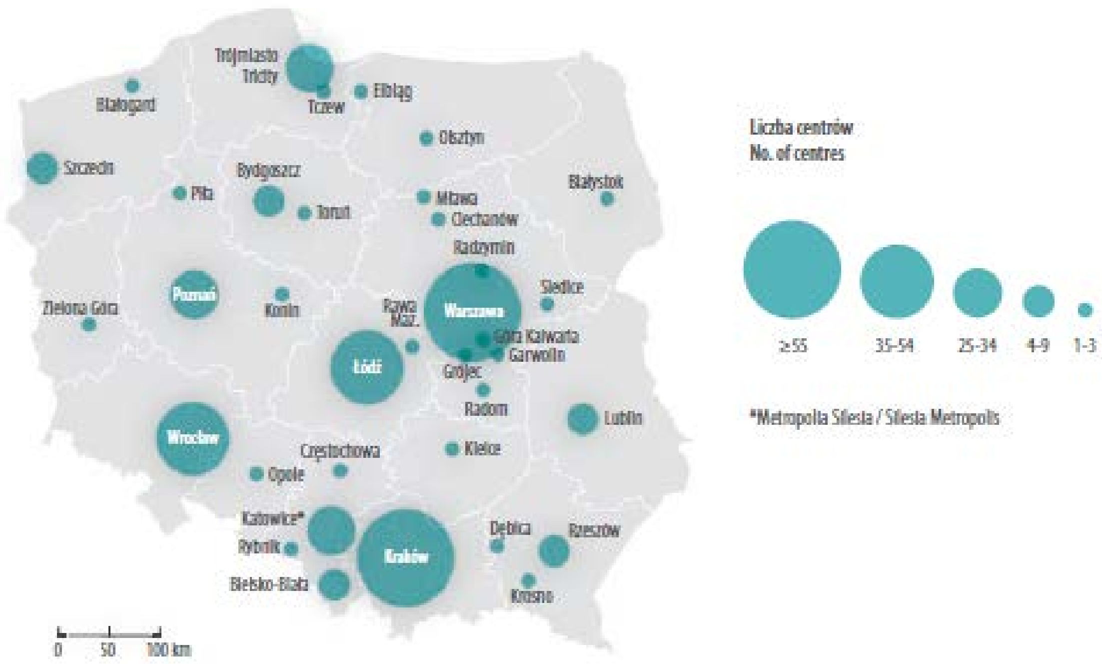
The largest number of jobs was in Krakow, with service centres employing 15,600 persons (22.6% of employment in the sector in 2010). Two other locations had employment levels above 10,000: Warsaw (16.9%) and Wrocław (14.9%).

[234] Gál, Z. (2009). “Future Bangalores? The increasing role of Central and Eastern Europe in services offshoring”. Centre for Regional Studies of the Hungarian Academy of Sciences, Pécs.

[235] Deutsche Bank Research (2006). “Nearshoring to Central and Eastern Europe”. Available at: http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD//PROD0000000000201757.pdf

[236] BPO Outcomes (2011). "Poland Takes Leading Role in Burgeoning Outsourcing Region". Available at: http://bpooutcomes.com/poland-takes-leading-role/ http://bpooutcomes.com/poland-takes-leading-role/

Figure 25: Employment in business service centres in Poland in 2010[237]



Between 2008 and 2010, employment in the business services sector in Poland expanded by nearly 50%. Wrocław had the largest increase with more than 100% growth over the two-year period. Large increases were also characteristic of Poznań and Szczecin (about 90% in both cases), and Łódź (with an increase of more than 70% increase of personnel in this sector).

Service centres in Poland were founded by companies from 22 states. The majority of centres belong to companies from the EU (52%, representing 49% of all jobs). Almost one-third of service centres with foreign capital in Poland are US investments. Since 2009 62,000 new jobs have been created in Central and Eastern European service centres with foreign capital, of which 28,000 in Poland. What follows from this is the fact that as much as 46% of the employment growth in the region has been generated by service centres operating in Poland. The other countries that are part of the CEE rank below Poland for both number of employees and of centres[238].

5.2 Selected sample of investment projects

This second section looks at the sample of projects selected for the analysis. It starts with a short description of each project and then describes the main characteristics of the sample of projects. Finally, it describes the aid scheme and the granting authority's approach for setting the level of aid allocated to investment projects.

Overview of projects
The case study builds on a sample of eight investment projects. Seven of these projects were initial investments to set up new business service centres in Poland (Carlsberg, Reuters, MAN, KPIT, State Street, UPS and UniCredit), and one project involved the extension and diversification of existing operations (Citibank). At the time of the study, one project had been terminated (KPIT) and two projects were still proceeding as planned (Carlsberg and Citibank). All other projects were complete.

The investment projects selected illustrate the rapid development of the "business service sector" observed in Poland and more generally in Central and Eastern Europe since 2000.

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[237] Association of Business Service Leaders in Poland (2012). "Business Services Sector in Poland". Available at: http://www.absl2012.epublish24.com/ABSL/assets/downloads/files/ABSL_2012.pdf

[238] Ibidem.

Table 14 Projects in the case study on Internal Business Services in Poland[239]

Beneficiary	Region	Instrument	Aid amount (m€, nominal)€	Max. aid intensity allowed (GGE)	Aid intensity awarded (GGE)
Carlsberg Accounting Service Centre	Miasto Poznań	Direct grant	0.261	40%	2.8%
Reuters Europe	Gdański	Direct grant	0.297	40%	4.4%
MAN Accounting Centre	Miasto Poznań	Direct grant	0.359	40%	4.3%
KPIT Infosystems Central Europe	Miasto Wrocław	Direct grant	0.329	40%	2.4%
State Street Services	Miasto Kraków	Direct grant	0.891	50%	7.1%
UPS Polska	Miasto Wrocław	Direct grant	0.225	50%	2.8%
UniCredit Processes and Administration	Miasto Szczecin	Direct grant	0.596	40%	7.3%
Citibank International Plc Oddzial z Polsce	Miasto Warszawa, Miasto Łódź, Olsztyński	Direct grant	0.361	30%	2.8%

Aid (m€): Total aid amount in million Euro
Invest. volume (m€, nominal): Total nominal eligible investment sum in million Euro
New jobs: number of jobs created
Aid/new job (k€): Total aid amount per job created in thousand Euro
Euro equivalent calculated based on exchange rate on the date of the notification
figures in () indicate a reduction in the number of jobs at the site

Carlsberg Accounting Service Centre:
Carlsberg is a Danish brewer and one of the largest brewery groups of the world. The project was an initial investment to set up a new facility for the Carlsberg Accounting Service Centre Sp.z o.o. in Poznan. The new Financial Services Centre was planned to provide accounting services exclusively to the European undertakings belonging to the Carlsberg group. The initial investment consisted of the acquisition of technical infrastructure and office equipment for the new centre in the amount of €0.96 million. The project's eligible costs covered two years of gross wage costs of the new hires, amounting to €9.25 million and the aid allocated corresponded to 2.81% of this amount. The investment project was due to create 280 new direct jobs by the end of 2009 and some 30 indirect jobs in the district

Carlsberg faced delays in the implementation of the project and had to renegotiate the investment schedule with the Minister of Economy. The project has now been completed.

Reuters Europe:
Reuters is a British media and financial information company. The project constituted an initial investment in setting up an Information Services Centre in Gdansk. The activity planned for the new centre consisted of market research, and financial and economic data processing from regions in Europe, Middle East and North Africa. The databases and processed information are distributed to Reuters' clients in the entire world. The project's eligible costs covered two years of gross wage costs of the new hires, amounting to €6.8 million and the aid allocated corresponded to 4.37% of this amount. The investment project was planned to lead to the creation of 300 new direct jobs by the end of 2008.

The project was completed as planned.

MAN Accounting Center:
MAN is German company manufacturing heavy lorries and diesel engines for various applications. The project constituted an initial investment in setting up the new facility for a MAN Accounting Centre Sp. z o.o. in Poznan. The new centre of accounting was intended to provide financial and accounting services exclusively to the European undertakings belonging to MAN group. The initial

[239] European Commission.State Aid Register . Available at: http://ec.europa.eu/competition/state_aid/register/

capital investment amounted to €0.6 million. The total eligible costs of the investment (gross wage costs of the new hires) was €8.4 million and the aid allocated corresponded to 4.27% of this amount. The project was expected to create 360 direct jobs among highly qualified young people and approximately 40 indirect jobs in proximity of investment.

The project is now completed, but MAN had to reduce the level of investment and hence also had to accept a reduction of the aid down to €0.36 million. At the time of the interview, however, the number of employees at MAN exceeded the project targets.

KPIT Infosystems Central Europe:
KPIT Cummins Infosystems is an Indian IT consultancy and service provider. The project was an initial investment in setting up a Central European Global Business Solutions and IT Development Centre in Wrocław. The activity planned for the new centre consisted of accounting, bookkeeping and auditing services. It also included software publishing, and business and management consultancy activities, especially for the banking/financial, motor vehicle and electronic sectors in Europe. The initial capital investment amounted to €0.9 million, the total eligible costs: €13.9 million and the total aid allocated was €0.329 million. The investment project was due to lead to the creation of 500 new direct jobs by the end of 2010

Although an aid was allocated to the project, the company decided not to pursue the investment. The Indian company no longer has any contact with the Polish authorities.[240]

State Street Services (Poland) Limited:
State Street Corporation is a US-based financial services company. It provides securities services to institutional investors and investment management services to mutual funds and other asset managers. The notified project involved the creation of a Business Processes Support Centre to render services to its foreign-based central office and clients within the area of comprehensive processes for investment fund accountancy and estimation (the so-called Asset Servicing Business). The project constituted an extension of an existing small entity in Krakow which was set up in November 2007 in order to carry out basic administrative tasks for the company's European offices. With the new project, the beneficiary was aiming to expand its current activities into a new market and to provide modern services. The initial capital investment amounted to €3.2 million (total eligible costs: €12.5 million).The aid allocated was €0.891 million. The investment project was due to lead to the creation of 334 new direct jobs by the end of 2010.

The project was completed as planned.

UPS Polska:
United Parcel Service (UPS) is a package delivery company headquartered in the United States. The notified project involved setting up a centre to render financial, accounting and administrative services for the companies in the group. The initial capital investment amounted to €2.3 million, the eligible costs were €8.0 million and the aid allocated corresponded to 2.82% of this amount. The investment project was due to create 316 new direct jobs over the period 2008-2009.

The project is completed but UPS had to reduce the level of investment and hence also had to accept a reduction of the aid down to €0.225 million. UPS nevertheless finally even exceeded the originally planned number of employees.

UniCredit Processes and Administration:
UniCredit SpA is a European bank headquartered in Italy. The project was an initial investment in setting up an Expertise Centre for Central and Eastern Europe in Szczecin. The activity planned for the new centre was a focus on services related to software, IT consulting and IT equipment; it also included services in the field of data processing and management of internet sites, as well as in the field of accounting and tax advice. The services to be proposed by the new centre related to the UniCredit group's mortgage and basic banking activities. The initial capital investment

[240] No contact could be established with the company. The Ministry received no explanations as to why the project was cancelled.

amounted to €4.1 million, the total eligible costs were €8.4 million and the aid allocated €0.596 million. The investment project was intended to lead to the creation of 435 new direct jobs by the end of 2010.

UniCredit faced delays in the implementation of the project and had to renegotiate the investment schedule with the Minister of Economy. The project is completed.

Citibank International Plc Oddzial z Polsce:
Citibank is a multinational bank headquartered in the US. The notified project covered the extension of existing Citibank operations in Poland. The new unit was intended to provide ICT support and data processing services to the undertakings belonging to Citibank worldwide. The project was intended to increase the value of the services currently provided by Citibank Int., including third line services, R&D and process development activities. The total amount of aid awarded was €0.361million. 200 new direct jobs were planned in Warsaw and 75 in both Lódz and Olsztyn.

In November 2011, the project was proceeding as planned.

5.2.1 Main characteristics of the projects selected

Type of investments
Six projects are "nearshoring" operations, i.e. detachment and relocation of business services within Europe. In the case of the non-European investors, State Street (USA) and KPIT Infosystems (India), the objective was to service internal (State Street) and external (KPIT) clients in Europe. Two projects are "offshoring operations" (Reuters and Citibank) as the centres were due to service undertakings worldwide.

Six projects are initial investments involving setting up a new centre in Poland. Only two projects (State Street and Citibank) involved the extension of existing operations.

Type of expenditure
Labour costs account for the lion's share of investment expenditure. Capital investments are limited, since all the companies are only leasing their office space. The capital investment concerns mainly in the design of technical infrastructure (including IT) and the acquisition of office equipment. In some projects, the base building fit-out was also modified, incurring higher capital investment, e.g. in the case of State Street.

Activities involved in projects
Six projects are Shared Service Centres (SSC) working for their parent companies and their units. Only two projects (Reuters and KPIT Infosystems) are typical Business Process Outsourcing (BPO) companies, i.e. they service clients outside their company.

State Street is a hybrid project: State Street Services Poland does not consider itself a BPO. Instead, the centre belongs to the more specific Asset Servicing Business sub-sector, whose services include collecting dividends and interest payments, processing corporate actions and applying for tax relief from foreign governments on behalf of customers. The company provides services to internal clients (other State Street offices), who then maintain the relationship with the ultimate external clients. The work produced from Krakow is, however, a major component of the end-client deliverable.

Only one project included a R&D component: Citibank's objectives included increased R&D capacities for the development of new processes and products, including software development for internal needs.

5.2.2 State aid scheme(s) and project selection

5.2.2.1 Presentation of the aid scheme

The granting authority for the cases in scope of this evaluation is the Minister of Economy.

In order to foster investments of crucial importance for the Polish economy, a special instrument was created in the form of the Long-term Support Programme, supervised by the Minister of Economy with the support of Polish Information and Foreign Investment Agency (PAIZ). The Long-term Support Programme was designed to support investments in the following "sectors" (following the terminology used by the Minister of Economy): biotechnology, aircraft/aviation, car manufacturing, electronic, modern services, and research and development. The instruments supports the implementation of the National Development Strategy 2007-2015, which sets the objective of attracting FDI but remains silent in terms of sectors.

The sector relevant to Internal Business Services projects is the so-called "modern services" sector. The aid scheme is an employment grant focusing on job creation. Eligible projects are new investments creating at least 250 new jobs.

By notifying the aid project before putting it into effect, the Polish authorities respected their obligations under Article 88(3) of the EC Treaty. By doing this, the authorities demonstrated the compatibility of the *ad hoc* aid measures with the EC Treaty.

5.2.2.2 Project evaluation

When applying for state aid, a company has to submit an application to PAIZ. The agency carries out an initial review of the project and formulates recommendations to the Ministry of Economy. In turn, the Inter-Ministerial Committee, chaired by the Secretary of State of Economy, formulates the final recommendations to the Council of Ministers, which makes the final decision (under the "Law of public finance").

The level of support per job ranges between PLN 3,200 and PLN 18,600 (Ca. €770 and €4,460). The actual support offered within this range is determined on the basis of a multi-criteria analysis. The criteria against which the projects are assessed are:

- number of jobs created;
- quality of jobs created, i.e. percentage of employees with higher education and the investment cost per employee;
- location of investment;
- complexity of processes performed by the company;
- uniqueness of processes performed by the company;
- level of involvement in the development of the region (including cooperation with universities);
- position on the market (global and regional).

A number of points is allocated to the project per criterion. The amount of support for a job is set on the basis of the total number of points and the number of jobs created.

One of the most important criteria is the complexity of the processes performed by the company. This is explained in the table below:

Table 15: Evaluation criteria "Complexity of projects"[241]

Location	Number of points
Data processing centre, contact centre	5-16
Centre for human resources management and financial accounting	17-34
Information Centres and financial engineering	35-44
Research and development centres, and software development and applications	45-55

[241] *Polish Ministry of Economy*

The methodology distinguishes between four areas in terms of location of the investment, as indicated in Table 16 below:

Table 16: Evaluation criteria "Location of investment"[242]

Location	Number of points
Warsaw	6
Krakow, Poznan	12
Wrocław, Gdańsk-Gdynia-Sopot	18
Other sub-regions (NUTS 3 classification)	25

Although in full compliance with EU regulation, this hierarchy differs from the national regional state aid map approved by the Commission. For instance, under the guidelines on national regional aid, the ceiling for regional investment aid is the same for Poznan and Wrocław, while Katowice (which is in 'other sub-regions' in the table) does not benefit from the maximum level of aid.

The incentive effect of the aid is checked by asking investors if they are considering alternative locations. This is done mainly to comply with the provisions of the RAG 2007-2013, and the authorities take the investors at their word.

5.2.2.3 Aid amount and intensity level

Aid intensity policy

The amount of aid is based on the criteria mentioned above. In the sample of projects analysed, the amounts of aid offered are considerably below the maximum ceiling set by the RAG. During the period 2007-2010, the ceiling for regional investment aid in Poland ranged from 30% (City of Warsaw) to 50%.

According to the Polish Ministry of Economy, the amount of aid is not negotiable, and the ministry does not deviate from the methodology presented above. The Ministry considers that these amounts are sufficiently attractive for the type of businesses considered to locate in Poland. The Ministry is also constrained by budgetary considerations.

The appropriate level of incentive is set by the Minister of Finance based on the methodology and criteria described above. Those criteria explain the variations in the level of aid in the project sample. For instance, the higher aid intensity allocated to State Street can be partly explained by the nature of the jobs created, i.e. financial engineering requiring a high level of education. In the case of UniCredit, the higher amount of aid can be explained by the location in Szczecin, which falls within the highest priority area.

Aid agreement and payments

Where an incentive package is approved, a grant agreement is signed with the beneficiary.

The beneficiary is under an obligation to carry out the investment as planned. In practice, a small deviation (about 10% of eligible expenditure) is allowed. Moreover, the sample of projects analysed indicates that renegotiation of agreements is a common practice (re-scaled project, extended work plan etc.). In any other cases, the company has to repay the aid amount including interest.

[242] *Polish Ministry of Economy*

5.3 Determinants of investment and locations decisions

5.3.1 Determinants of investment decisions

5.3.1.1 Main determinants of investment decisions other than regional aid

The main drivers of the beneficiaries' investment decisions were:

Need to increase efficiency: In all projects, cost reduction was a key investment driver, since this is the essence of business services offshoring. However, the perspective differs between SSCs and BPOs, since the former relate to any kind of companies detaching and relocating selected business processes within the scope of the commissioning entity, while the latter the latter relate to companies whose core business is business process outsourcing (e.g. Reuters). In that case, the main investment driver is to increase demand for business process outsourcing services, while the client's objective is cost reduction.

Five of the seven projects analysed are captive investments (as opposed to outsourcing) through the creation of SSCs. These projects were primarily driven by the need to increase the competitiveness of existing operations. In such cases, the projects supported a business transformation strategy, i.e. process optimisation and standardisation, with the aim of increasing flexibility and quality, and reducing costs. These projects consist of the creation of shared services centres (SSCs) servicing commissioned business processes for parent companies and their units, mainly in Europe. Services provided by these business units include financial and accountancy processes and reporting, administrative activities, data processing, etc.

Growing demand: Six of the seven projects were either to a large or some extent undertaken in a context of growing demand in the investors' core business. Yet, only in two projects was the investment undertaken first and primarily as part of a growth strategy: State Street and Thomson Reuters. Both projects include BPO components and serve clients other than their parent companies and their units:

State Street (a Boston-based company) decided to develop its activities on the European and Asian markets in 2006. The centre in Krakow was created in 2007 to support this expansion and provide European and international clients with standard products, mainly monitoring and reporting as well as basic operations on transactions, while local business units are focusing on the interface with clients.

Similarly, Reuters decided to establish a business process outsourcing centre in Gdansk after it acquired the society EcoWin in 2005. EcoWin already had an office in Gdansk and Reuters decided to develop this office while also changing the nature of services delivered. The centre is now focusing on market research and financial and economic data processing from Europe, Middle East and Africa. Databases and processed information are distributed to Reuters' clients in the entire world.

5.3.1.2 Incentive effect of the aid on the investment decision

The availability of regional aid had very limited impact on the principal decision of companies to invest. According to beneficiaries, the aid may have had an impact on the investment's size, timing and content, but at the margins and without any clear-cut causality between the aid and the scope/size of the projects. Possible impacts include the decision to recruit a higher number of people within a shorter period of time (mentioned in the case of MAN and Reuters, and referring to the aid conditionality) and the decision to improve the quality of the investment through more investment in new processes or training, for instance (Carlsberg and UPS). Overall, the amount of the aid was often deemed to be of limited significance to this investment decision. The percentage of the investment funded by the aid in the projects analysed ranged from 2.37 (KPIT) to a maximum of 7.32 (UniCredit).

However, industry stakeholders did consider grants to be an integral part of their investment plan. From a financial point of view, the aid makes it easier to obtain matching of funds, and early payments can have a positive influence on cash flow and net present value calculations.

5.3.2 Determinants of location decisions

5.3.2.1 Main determinants of location decisions other than regional aid

The determinants of the location decisions are quite similar across these investment projects. Three determinants were systematically taken into account when selecting the location (mentioned by interviewees in all projects analysed):

Low labour costs: the cost of labour was a systemic and dominant location factor, mentioned by all beneficiaries. Combined with the quality of the higher education system, low labour costs also explain why all investors considered Poland together with other Central and Eastern European Countries in their preliminary screening of possible locations (see also section 5.3.2.2 below). Only in two projects were locations not in central and eastern European countries considered: in the MAN project, Germany was considered, since this is where the HQs are located; in the State Street project, other European countries where the company was already established were also considered, but low labour costs in Poland outweighed the risks pertaining to a new location.

The cost of labour not only played a role in the choice of a country, but was also an important factor in selecting a location within Poland. The local employment markets were scrutinised carefully by the investors before making a decision. According to PAIZ and the Ministry of Economy, investors do not hesitate to establish service centres in cities where the level of education and expertise of the labour force is lower: they prefer to train their employees themselves rather than to pay for a trained and experienced workforce. One example for this is the presence of UniCredit in Szczecin, where the concentration of business services is lower than in other large cities in Poland (as shown in Figure 25 above in terms of number of people employed).

Availability of skilled labour force*:* the quality of the labour force was also a determinant of the location decision in all projects, and it appears that this is a strong asset for Poland compared to other locations in Europe. This includes:

- **Quality of the higher education system** in general, and in accounting and finance in particular. According to beneficiaries, Polish universities have a strong reputation, and they deliver excellence in accounting and finance (e.g. Krakow and Poznan University). The quality and specialisation of local universities are also part of the rationale when selecting a city in Poland.
- **Language skills***:* since shared centres provide services all over Europe (or even worldwide in the case of States Street's and Reuters' centres) the ability of the Polish labour force to work in foreign languages was an important location factor. English is a prerequisite, but more specific needs can also play a role when selecting a specific city. For instance, there is a strong demand for German-speakers. This determined UniCredit's decision to locate its investment in Szczecin, and also drove MAN's decision to invest in Poznan. Another example is Carlsberg: Poznan University's specialisation in Scandinavian languages played a role in the company's decision.

Quantitative availability of labour force: investors favour locations with easy access to labour force. This is not only a matter of matching skills but also a matter of labour costs, which are locally determined. For this reason, investors tend to prefer locations where the number of shared service centres is relatively low, and where the size of the university and the annual number of graduates are large. Lower competition on the job market partly explains why Carlsberg and MAN decided to locate in Poznan rather than in Krakow or Wrocław for instance. In the case of UPS, State Street and MAN, quantitative availability of staff was not only a matter of costs; the investors wanted to ensure that they could recruit a large number of people within a short period of time, and that the labour force would also be available in sufficient quantity for future development plans in the medium term.

Other determinants mentioned by the interviewees were (in decreasing order of occurrence):

Support from local authorities: in terms of soft location factors, the support provided by the Polish Information and Foreign Investment Agency (PAIZ) in finding the right location in Poland were mentioned in most projects as having been an influential factor. Good cooperation with the local authorities during the explorative phase was also mentioned as an element that influences the final decision. This includes the efforts made by the city councils to meet the needs of the company, as well as the willingness of the universities to cooperate and adapt their curricula to the companies' demand. Altogether, these locations factors were mentioned in six out of seven projects.

Costs (and availability) of offices: the availability, cost and value for money of office space was an important criterion in the final decision, mentioned explicitly in five out of the seven projects. Low operating costs (cost of labour and office space) are key in the case of internal business services since efficiency and cost optimisation constitute one of the main investment drivers.

Transport and accessibility: in four projects, good flight connections to the headquarters locations mattered to a large extent. This included direct flights from Poznan to Copenhagen in the case of Carlsberg, or to Munich in the case of MAN.

Political and economic stability: According to the ABSL and the beneficiaries interviewed, Poland is said to offer political and economic stability, partly due to the EU membership and partly due to the steady economic growth in the country since the last ten years[243]. As seen in section 5.1.2, the accession of Poland to the EU boosted foreign direct investment (FDI) in the Internal Business Services sector. Political and economic stability was also mentioned as a location factor in four projects. According to the Association of Business Service Leaders in Poland (ABSL) and the Polish authorities, political turmoil in Egypt and Tunisia also strengthened the competitive position of Poland.

Business environment: Poland is deemed to offer a business friendly environment, which was mentioned as a significant location factor in four projects. This relates more specifically to low corporate tax rates, which was mentioned as a location factor in four projects.

Pre-existing operations: Pre-existing operations on-site was said to be an important location factor in three projects (Reuters, Citibank and MAN). For example, MAN was already established in Poznan, where the company had a production unit: the administrative employees from this unit were the first to be employed in the MAN Accounting Centre. In the case of Reuters, the location decision was determined by the fact that EcoWin already had an office in Gdansk.

Other: In two cases, EU taxation laws and accounting systems were also mentioned as determinants for locating investments in Poland rather than in countries outside the EU. This is due to the fact that a number of centres provide services that require specific knowledge of the relevant EU/European legal framework. Also, the Single Euro Payments Area has increased the "offshorability" of some financial and accounting activities. Other location factors were IT infrastructure (Reuters) and time zone (State Street's centre, which provides services worldwide).

All investments were located in cities in order to ensure easy access to a young and educated labour force and benefit from urbanisation economies.

[243] The number of companies in the business services sector in Poland increased significantly after 2004 and the accession of Poland to the EU. ABSL noted in its latest report that 3 out of four business were created after the accession of Poland in the European Union in 2004. Please refer to: Association of Business Service Leaders in Poland (2012). "Business Services Sector in Poland". Available at: http://www.absl2012.epublish24.com/ABSL/assets/downloads/files/ABSL_2012.pdf

5.3.2.2 Incentive effect of the aid on the location decision

Decision mechanisms

Typically, investment projects involved the setting up of an ad hoc project team that reports directly to the company board. The person responsible for the investment would in many instances be the head of the Polish service centre for at least the first few years of operation. In at least four cases, the project team hired a consultant to help identify the right location for investment.

The decision mechanisms often followed a sequential approach, where the first step was to decide the investment in CEE (for low labour costs within the EU), the second step was to identify the country of investment, and the third was to identify the city. The second step was sometimes bypassed, and several cities from different countries in CEE were compared.

Alternative locations

This study distinguished between alternative locations in Europe and beyond, and alternative locations in Poland.

Other Central and Eastern European Countries were mentioned as *alternative locations outside Poland* in most cases. According to the Association of Business Service Leaders in Poland (ABSL), Central and Eastern European Countries accounted for 6% of the global services offshoring market in 2009. The majority of investors were companies from Western Europe. ABSL estimates that employment in the "business service sector" in Central and Eastern Europe grew by about 188,000 in 2010 (of which approximately one third was in Poland), an increase of 21% over 2009[244].

In six of seven projects, interviewees considered other central and eastern European Countries as alternative locations to Poland. Slovakia, Czech Republic, Hungary and Romania were the most frequently mentioned. Outside Europe, India, the global leader with 40% market share, was mentioned in two cases. The complexity of the functions was a factor in looking at different locations. For functions with lower complexity, both India and Romania were mentioned. For functions with higher complexity, Poland competed with Slovakia (Bratislava) or Hungary (Budapest), for example. In general, the competitive advantage of Central and Eastern Europe compared to India lies in the skilled labour force, cultural proximity and data protection issues.

The main discriminating factor in the final decision to invest in a region in Poland varies from one case to the other. However, it is generally acknowledged by the interviewees that a combination between the high quality of the labour force (both in terms of technical skills - accounting and finance - and language skills) and low salaries makes Polish regions highly competitive locations.

In six of the seven projects (with the exception of Reuters), alternative locations in Poland were also considered. Warsaw and Krakow were the most frequently mentioned alternatives. Lower operating costs, both in terms of salaries and rents, were the main reason for investing in a location other than Warsaw and Krakow. In at least three projects, interviewees claimed that a too high concentration of shared service centres in a city was assessed negatively, as it engenders higher labour costs.

Aid incentive

The availability of grants was not mentioned as a decisive factor in the decision to locate in Poland. The possibility of receiving state aid was screened at an early stage of the process, but in a number of projects, the definite amount of aid was not known when the location decision was taken.

In two projects, the possibility of investing at another location was explicitly mentioned as a possible alternative scenario in the event of no state aid, but there was no clear case where an investor selected a city due to the possibility of receiving a higher amount of aid. In accordance

[244] Association of Business Service Leaders in Poland (2012). "Business Services Sector in Poland". Available at: http://www.absl2012.epublish24.com/ABSL/assets/downloads/files/ABSL_2012.pdf

with the RAG, the government allocates higher grants to projects that are not located in Warsaw or other major cities in Poland (see above), but it appears that the market provides good incentives to invest in less developed cities in Poland. These are mainly lower salaries on the local labour market, but they are usually combined with another unique selling point such as local universities, specific (language) skills or good flight connections to the headquarters' location for instance. Another explanation for the weak aid incentive is the small size of the grants allocated.

Though not decisive, beneficiaries still considered state aid as a positive element in the location decision. State aid is seen as an indication of the willingness of authorities to support the investment. This is also seen as a guarantee of long-term cooperation with the local authorities, including opportunities to obtain further grants in the event of future investments.

The case of Citibank is interesting, as its application for state aid to establish new activities in Warsaw was initially rejected by the Ministry of Finance. Following the advice of the Polish Information and Foreign Investment Agency (PAIZ), Citibank applied again but included investment plans in Łódź and Olsztyn as part of the project; the application was then accepted. It is less than certain that the decision to locate in these cities was mainly driven by the possibility of receiving state aid. It seems that it was more a matter of timing of the two investments, especially as the two sub-projects in Łódź and Olsztyn would not have been eligible alone, since they did not reach the minimum ceiling in terms of jobs created (75 in both locations, whereas there is a minimum ceiling of 250 jobs). However, this case shows how state aid opportunities combined with continuous dialogue with the development agencies can influence companies' investment plans at the margin.

5.4 Benefits of the investments

The Ministry of Economy provided information on the achievements for the projects at the end of 2010. As can be seen from below, half of the projects had been completed at this time.

Table 17: Project status and achievements[245]

Beneficiary	Status	Planned				Achieved*			
		Aid (m€)	Invest. volume (m€, nominal)	New jobs	Aid/ new job (k€)	Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/ new job (k€)
Carlsberg	Proceeding	0.3	9.2	280	0.93	0.2	9.25	285**	0.66
Reuters	Completed	0.3	6.8	300	1.02	0.3	6.79	950**	0.32
MAN	Completed	0.3	8.4	271	1	0.3	8.40	302**	0.90
KPIT Infosystems	Cancelled	0.3	13.9	500	0.66	-	-	-	-
State Street	Completed	0.6	12.5	334	1.73	0.6	12.50	334**	1.72
UPS Polska	Completed	0.2	8.0	316	0.71	0.2	-	366	0.61
UniCredit	Completed	0.3	8.1	340	0.87	0.3	7.19	340**	0.87
Citibank	Proceeding	0.4	12.7	350	1.03	0.2	-	200	1.03

Aid (m€): Total aid amount in million Euro
Invest. volume (m€, nominal): Total nominal eligible investment sum in million Euro
New jobs: number of jobs created
Aid/new job (k€): Total aid amount per job created in thousand Euro
Euro equivalent calculated based on exchange rate on the date of the notification

[245] Source: European Commission, State aid register; *Polish Ministry of Economy (31st December 2010); **Beneficiaries (*June 2012)

In about half of the projects, the financial and economic crisis had an impact on investment plans. UPS and MAN had to reduce the level of investment and hence also accept a reduction of the amount of aid. Carlsberg and UniCredit also faced delays; instead of reducing the amount of investment and aid, however, the companies renegotiated their grant agreements with the Ministry of Economy in order to extend the investment schedule. The sample reflects a general decrease in demand due to the recession on global markets. The impact of this cyclical variation was greatest on the financial sector which is a key driver of the Internal Business Services market.

At the end of 2011, the Carlsberg project had been completed and in many projects, the number of jobs created was higher than expected. This is described below.

Finally, it should be noted that the aid amount per jobs created are the lowest in the case of the Internal Business Services in Poland compared to any other cases.

5.4.1 Effects on direct jobs

Gross change in direct jobs:
All projects – with the exception of KPIT – generated a substantial gross creation of jobs. A majority of the companies hired more people than planned when the state aid application was submitted, as they continued to grow after the planned investment was completed. The most striking examples are Reuters (about 950 employees in June 2012) and State Street (about 1,100 employees, although the beneficiary itself was only prepared to acknowledge that ca. 300 jobs can be strictly attributed to the aided investment).

Almost all new employees have been employed locally. According to the beneficiaries, in most projects, 5% or fewer of new employees were brought to the region as expatriates. The only exception is Reuters, which brought up to 40% of its new employees into the regions (no explanation could be collected). Finally, in all projects (including Reuters), the beneficiaries indicated that more than 80% of the newly hired employees live within a 50 km radius of the investment site.

More generally, the business services off-shoring sector had a strongly positive effect on employment in Poland during the relevant period. From 2007 to 2010, employment in the business services sector in Poland has grown by nearly 60%[246]. This compares to 4.8% in the economy as a whole[247].

Quality of jobs and training:
In the majority of projects, the high quality of jobs was mentioned as a positive effect of the investment project. In the case of Citibank, the objective of the investment was to increase capacities while also developing more advanced services (higher added value, including R&D activities) as an attempt to maintain the competitive position of the Polish centres within the Citibank group. In the case of Carlsberg and UPS, interviewees stated that the investment was an opportunity to develop new processes and new management models, which are deemed to ensure a high quality of the jobs. Many beneficiaries point to the quality of the jobs created, as a large majority of the new employees have a degree in higher education[248].

Beneficiaries also claimed that they invest significantly in training employees, which is however only partly confirmed by the data provided by them: €100,000 to €250,000 are spent annually on training the new employees, which in terms of expenditure per new hire is in the low to medium range in the whole sample of 28 projects.

[246] ABSL: Business Service Sector in Poland.

[247] Eurostat: Employment (main characteristics and rates) - Annual averages.

[248] "Poland is a nation of about 38 million people which produces 400,000 new college graduates every year"; retrieved from BPO Outcomes (2011). "Poland Takes Leading Role in Burgeoning Outsourcing Region". Available at: http://bpooutcomes.com/poland-takes-leading-role/ http://bpooutcomes.com/poland-takes-leading-role/

The companies and the granting/local authorities are confident that the jobs created are sustainable. Four of the seven investors interviewed have plans for further expansion, and some of them are planning to apply for additional grants. In order to increase the sustainability of the jobs created, a few interviewees mentioned the need to increase the complexity of functions and move towards high-added value services. These jobs would not be easily relocated to places where the labour force is cheaper and less skilled than in Poland (e.g. Egypt, Tunisia, and India).

Indirect effect on jobs and additional demand in the regions

Indirect effect of the investment phase:
Of the five beneficiaries who answered this question, only two provided some indication of the total investment volume that was spent with suppliers located in a 50 km radius around the site of the investment. Answers indicate that a very large share of the total investment was spent locally. However, these projects induced low investment volumes in fixed assets (ca. €1.5 million on average) and the salaries constituted the costs eligible for regional aid. The initial investment volume mainly covered the design of technical infrastructure (including IT) and the acquisition of office equipment and utilities. In some projects, the base building fit-out was also modified. Hence, the investment phase of the project had indirect effects.

Indirect effect of the operating phase:
Without doubt the development of service centres in Poland has been beneficial to regional economies. Not only does the sector create jobs for young graduates from local universities, but it also contributes to stimulating investments in office buildings, transport infrastructure, etc. Most of the companies visited were located in brand-new premises and business parks, so that it appears that investment projects were beneficial to the construction and real estate industry. As indicated by ABSL, companies from the business services sector have become important players on the real estate market. These companies occupy approximately 550,000-690,000 m² of offices in major Polish cities (about 10% of modern office space available in Poland)[249].

Table 18 Impacts of investment in operating phase

Company name	Number of indirect jobs created within 50 km radius	Additional turnover or savings (-) generated by investment € m	Percentage of additional turnover spent within 50 km radius of site
Carlsberg Accounting Service Centre	50	-9.0	-
MAN Accounting Centre	10-20	7.1	26% - 0% Goods/Equipment - 26% Services - 0% other supplies
State Street Services Poland	n/a	n/a	n/a
UniCredit Processes and Administration	60	1.3	>= 55% - 5% Goods/Equipment - 50% Services

According to the beneficiaries, a significant share of the additional turnover generated during the operating phase was spent on services from a *supplier base* located within a 50 km radius of the site, mainly for services. According to MAN, for instance, an additional €7.1 m of annual turnover was generated thanks to the investment. Of this, 26% was spent on services locally. In the UniCredit project, the beneficiary indicated that they were spending 55% of the additional €1.3 m of annual turnover generated as a direct effect of the investment locally.

All interviewees said that the investment was highly beneficial, especially for their suppliers as the beneficiaries' new establishments led to completely new business opportunities for them.

[249] Business Services Sector in Poland, Association of Business Service Leaders in Poland, Warsaw, 2011.

Additionally, three beneficiaries pointed out that their investments induced investments by some of their suppliers as well. For example, interviewees from UniCredit and MAN mentioned that IT service suppliers and recruiting agencies had been growing since their investment and some of them had themselves invested in new office space. MAN also noted that suppliers were able to strengthen their position on the market with MAN's accounting centre as a reference. The beneficiaries estimate that between 10 to 50 indirect jobs were created by their investment in a 50 km radius around the site. This is, however, relatively low compared to other case studies dealing with industrial sectors rather than services.

None of the company serves clients locally (except MAN which provides support to another business units established in Poznan). Hence, no impact on the *client base* could be observed locally.

5.4.2 Other effects

Cooperation with higher education institutions
Five projects reported close cooperation with local universities. Interviewees mentioned cooperation in recruitment processes, as well as cooperation in adapting academic programmes in order to better address the needs of the market. The largest companies in the business services sector in Poland have also launched specific programmes in collaboration with universities. Reuters financial and bank programme, carried out in cooperation with the University of Gdansk, is a good example. Such cooperation benefits the universities through financial support for research activities and purchases of educational software and equipment.

In three projects, language courses organised by local authorities were mentioned. There are indications that these courses were co-financed by EU funds (ESF).

Spill over effect
There is some evidence of spill over effects from the sample of projects. First of all, large investment projects by well-known companies can be used for marketing purposes by the regions in which they invested. For instance, MAN is recognised as a flagship for the Poznan region to attract more investors, and cooperates with the local authorities and PAIZ when potential investors visit the city. A similar example is to be found with Reuters in Gdansk, who has been approached by other investors.

An intra-sectoral clustering effect could be observed in Poznan. Carlsberg and MAN described ongoing specialisation and improvement of services provided by local companies, such as recruitment agencies and IT service suppliers, and universities too have been improving their programmes in order to meet the companies' demands. Hence, both companies claim that their investments have contributed to developing a finance and accounting services cluster in Poznan, and possibly influenced IKEA's decision to establish its new internal accounting centre in Poznan. Similarly, some indications of intra-sectoral spill over effects could be observed from Reuters' investment. This has contributed to reinforcing the information technology and software sub-sector in Gdansk, including cooperation with and knowledge transfer to the University of Gdansk. Similarly, it is to be expected that the Citibank investment is contributing to the operation of systems and databases sub-sector in Łódź, and State Street to the finance and accounting sub-sector in Krakow. However, no concrete evidence of intra-sectoral spill over effects could be identified in those cases.

The evidence collected during interviews with the beneficiaries indicates that investors are not highly interested in intra-sectoral localisation economies. On the contrary, one of the location criterion most commonly mentioned by beneficiaries was the quantitative availability of a labour force. The implication of this in consequence is that the concentration of Internal Business Services in a specific city should not be too high.

Follow-on investments planned by the beneficiaries
Overall, the impact of the investments for the companies was considered positive in all projects. As mentioned above, four of the seven investors interviewed have plans for further expansion, with the aim of increasing their capacities and developing activities requiring more specific

knowledge. As a consequence of the positive development of its centre overall, Carlsberg will be expanding its activities from purely financial services to general business services in the near future and continues to invest in the region. This mirrors well the assessment of the Association of Business Service Leaders in Poland (ABSL) of the sector's future development[250].

5.5 Impacts on competition and other regions

5.5.1 Impact on competition

The internal business services cover a wide range of markets, thus any attempt to conduct an in-depth analysis of the efficiency of the market is not realistic. Hence, this case study takes a slightly different approach compared to other case studies in this report.

Moreover, it should be directly mentioned for a start that the amount and intensity of aid awarded to investments in this case study are particularly low compared to the other sectors and countries cases considered in this report, hence the risk of distortion relatively limited at all levels.

Effect of aid for other business service centres in Poland

Congestion effects and potential crowding out of investments could be noted in a majority of cases in the form of tightening local labour markets and increasing operating costs (higher labour costs and rents) due to a high concentration of central service centres in some locations. This phenomenon seems to be greatest in Krakow, but is also observed in Wrocław and Poznan. Interviewees commented that the increasing number of shared service centres in Poland might jeopardise recent developments. In Poznan, Carlsberg and MAN are facing increasing competition on the job market. This results in rising staff turnover and salaries. One interviewee mentioned the role of IKEA in Poznan: the company opened a financial service centre in spring 2011 and adopted an aggressive wage policy in order to attract and retain people.

The rising cost of doing business in Poland is a concern, and in one case the risk of delocalisation of jobs from Poland to another location offering lower operating costs was mentioned. One way to address this challenge is to move up the value chain. State Street offers functions with high complexity as well as rewarding working conditions in its service centre in Krakow and faces no problems, while typical shared service centres in Krakow have been facing an overheating job market with sharp increases in salaries and high staff turnover.

Therefore, with the rapid development of the business services sector in Poland, it is expected that investors will shift to the non-cost competitive advantages of the Polish economy, such as education, but also infrastructure (including high quality office space, access to international airports) and quality of life[251].

The net impact of this phenomenon in terms of crowding out of private investment remain limited at a macro level, and Poland (including Krakow) remains one of the top destinations for business services outsourcing in Europe[252].

Impact on aid for competitors within relevant sectors of activity

In relation to barriers to entry it has been stated that these are very low and that outsourcing business services to Poland remains a relatively straightforward process for a company. This has led to what may be seen as an excessive concentration of business services in some parts of the country, resulting in a growing pressure on the job market and increasing business costs. At a

[250] According to the business association, offshoring services will keep developing dynamically, especially in the area of advanced, knowledge-based services, which are a source of added value. According to a survey conducted by ABSL, over 75% of centres' representatives intended to increase the number of employees in their entities in the following three years. Moreover, most of the respondents claimed that their centres would not relocate their activities within the coming three years. However, the survey also shows that in some 20 per cent of centres, relocations are planned, mainly to replace less advanced services with activities requiring higher expertise. See: Business Services Sector in Poland, Association of Business Service Leaders in Poland, Warsaw, 2011.

[251] Chilimoniuk, E. Radło M.J.K. (2008). "Service Offshoring and Location Factors: Evidence from Poland": http://www.etsg.org/ETSG2008/Papers/Radlo.pdf.

[252] Tholons Top100 Outsourcing Destinations. Available at: http://www.tholons.com/TholonsTop100/index.html.

more general level, Poland has acted effectively to create a business friendly environment, with the World Bank awarding the country as a top performer in this respect.

Since some of the projects selected were implemented by larger organisations in the European and global economy, their market power could be seen to be of concern. For instance, in the banking sector, Citibank International is the world's fourth largest bank by total assets in 2011, with approximately 200 million customers in 160 countries[253]. In Poland, it held a 23% volume market share in credit cards in 2011 and is one of the main financial institutions operating in the country through its branch City Handlowy[254]. Unicredit is the largest Italian bank and the second largest in Poland through its branch Pekao Bank that holds a 12.5% market share for banking services[255]. In the delivery services sector, UPS is one of the world leading delivery companies, with the second largest freight airlines[256] and a strong network in Europe due to the acquisition of the majority share in the Dutch TNT Services. Carlsberg is the fourth largest brewery company in the world[257]. However, such concerns need to be set against the size of the grants and the worldwide coverage of these companies

No evidence of market distortion through market power could be identified. Only one competitor to UPS could be interviewed[258], but he confirmed that the amount of aid too small to be a matter of any concern. The competitor also has a Share Services Centre located in the UK and so was not in direct competition with UPS for access to the local workforce.

5.5.2 Impact on other regions

In a similar manner to the case study on the car industry in Slovakia and Hungary, this case study deals with investments, for which the cost of labour was a decisive determinant. Hence, the decision to locate the investment in Central and Eastern Europe might be expected to have a potentially negative impact in other regions in Europe.

It was not possible to estimate the exact number of jobs created or lost in net terms, but it emerged clearly from the interviews that in at least four projects, the gross increase in direct jobs in the investment regions corresponds to a large extent to jobs transferred from other locations – mainly European countries – to Poland. In the case of Carlsberg's accounting service centre, for instance, the creation of new jobs clearly caused job losses in an equal number in Denmark. In two projects, some proportion of the jobs transferred was from equally, if not less developed regions (Portugal in the case of MAN, the Baltic States in the case of Carlsberg). No detailed information could be collected on the net direct effect of investments on jobs, and it has to be acknowledged that it is not the interest of the beneficiary to report net job destructions. On the contrary, it can reasonably be assumed that the cost reduction strategies pursued by most beneficiaries have resulted in a destruction of jobs in net terms.

Only in the case of State Street and Reuters, did a majority of the jobs created in Poland correspond to a net increase in employment at EU level, simply because the investment corresponded to a growth strategy on the EU market.

[253] The Economist (2011). "The world biggest banks". Available at: http://www.economist.com/node/18898228

[254] Retrieved from Citigroup website. Available at: http://www.citigroup.com/citi/news/2012/121017f.htm

[255] Retrieved from Unicredit Global Transaction website. Available at: http://www.gtb.unicredit.eu/global-transaction-banking/groups-home-markets/poland

[256] Rodrigue, J.P. (2009). "UPS: logistical management in the distribution sector". Available at: http://people.hofstra.edu/geotrans/eng/ch5en/appl5en/ch5a2en.html

[257] Reuters 2010" Top four brewers make up half global beer market". Available at: http://uk.reuters.com/article/2010/02/08/uk-beer-idUKTRE6173IZ20100208

[258] A total of 16 competitors where approached

5.6 Conclusion

The following conclusions can be drawn from the projects analysed in the Internal Business Services sector in Poland:

Determinants of investment or location decisions of the aided firms
The initial decisions by companies to invest in a business centre in Poland were driven by efficiency-seeking through cost reduction, increased capacities and enhanced quality of services. Some interviewees acknowledged that the aid may have had an impact on the timing, size and content of the investments. This impact is likely to have been marginal, and hence it can be concluded that the aid did not drive investment.

Low labour costs were the dominant location factor and for this reason in almost all projects only CEE regions were considered. Other important location factors were the availability of labour in qualitative and quantitative terms. In a few projects, investments were steered towards the least developed regions in Poland, but the main driver was lower salaries on the local labour markets due to lower competition for labour force locally. In such circumstances, aid did not substantively compensate for the additional costs of locating in least developed regions, but added to the already existing (and potentially sufficiently high) incentive of locating in least developed regions. From this, it can be concluded that the locations of the investments were only very marginally influenced by the availability of aid.

Consequences of the investments in terms of regional and employment benefits and externalities
The investments were beneficial for the Polish regions where they occurred, especially in terms of direct jobs. The number of jobs created (several hundred for each project), and almost the entire workforce was recruited locally. Although limited in volume compared to other case studies in this report, some positive indirect impacts on the supplier base were also identified. This mainly relates to the IT, human resource and real estate sectors. Finally, the projects have contributed to the development of a business services cluster in Poland.

State aid has had a limited impact on investment and location decisions, thus the impact of investment on the regions cannot be attributed to the availability of state aid. However, the overall size of grants paid by the granting authority was low both in terms of total amount and gross grant equivalent. This can be seen as a further explanation for the limited impact of the aid in investment and location decisions, but it is also the consequence of the Polish authorities' strategy to allocate relatively low grants (as a percentage of total eligible investment) to investors who already have good reasons to come to Poland (reverse causality). Hence, low benefits compare to low costs of the aid. For the granting authority, the value of the aid lay in showing good will and commitment to investors and in promoting the least developed regions in Poland. Investor stakeholder perceived the granting of aid in the same manner.

The distortive effects of aid for competitors and/or other regions
There is no evidence of a distortive impact on competition. This can be explained by the relatively small size of grants and investments in relation to the total value added of the production of the final services. The aided investment did contribute, however, to tightening local labour markets and increasing operating costs (higher labour costs and rents) in some locations as a result of a high concentration of central service centres (so-called congestion effects).

In most cases, the creation of jobs in Polish regions as a result of investment corresponded to loss of jobs in other Member States. The net impact at EU level cannot be quantified, as the jobs created in Poland might have been created elsewhere in Central and Eastern Europe otherwise, but might also have been created outside Europe.

6. CEMENT INDUSTRY – HUNGARY

This fifth case study looks at the cement industry in Hungary. It builds on two investment projects.

6.1 Background

This section introduces the particularities of the cement industry. The conditions of the global and European markets as well as the peculiar value chain structure are considered to provide a clear summary of the challenges the industry has to face. Immediately after, insights into the Hungarian market dynamics are provided to allow for a better understanding of the investment decisions behind the projects analysed in the sample.

6.1.1 Introduction to the cement industry

Cement is the major component for concrete and thus one of the most important and most often used building materials. Consequently, the cement industry is highly dependent on the dynamics of the construction industry which itself develops in line with economy as a whole, showing thus a strong pro-cyclical behaviour. The breakthrough for this cheap and versatile material in the 20th century came when so-called Portland Cement became an essential element in mortars and concrete structures[259] .

The European Cement Association (CEMBUREAU) claims that the cement industry represents 45,000 direct jobs in the European Union, but does not require high amounts of manpower due to recurrent innovations and the high level of mechanisation of the production process[260].

Because of this, the cement industry is one of the most capital-intensive industries and its investments are amortised only over long time periods. The costs of building a new cement plant are usually equivalent to around three years' aggregate turnover. On top of that, with electricity consumption of around 100-110 kWh/t of cement during the production cycle, it is also highly energy-intensive[261]. For what the final output is concerned, as the products offered by different companies have similar properties, these can be easily substituted and therefore the price elasticity in this sector tend to be high.

According to industry representatives, the weight of cement cannot economically be transported beyond 200 or at most 300 km (at a price of €70-100/t, transportation costs amount to €12/100km). Cement plants are most sensibly located closer to quarries than to consumer centres because the chemical reaction during the conversion from limestone to cement results in a large decrease in mass, thus minimising the transport costs. Bulk shipping is a considerably cheaper alternative and has improved the transport options, provided that the production areas are near to port facilities. Overall, anyways, transportation costs cluster large markets into

[259] Hungarian Cement Association (MCSZ). "Cement production in general". http://www.mcsz.hu/en/index.php?menu=2&oldal=5.

[260] CEMBUREAU (2012). Cement industry – Main Characteristics. Available at: http://www.cembureau.be/about-cement/cement-industry-main-characteristics, accessed on: July 25, 2012.

[261] Ecorys (2011)."Methodology for the free allocation of emission allowances in the EU ETS post 2012 – Sector report for the cement industry". Available at: http://ec.europa.eu/clima/policies/ets/benchmarking/docs/bm_study-cement_en.pdf, accessed on: July 25, 2012.

regional areas[262]. It is estimated that only about 5% to 7% of worldwide cement production is traded internationally[263].

With the five largest European companies accounting for more than half the total cement output in EU-25 in 2003 and each comprising 23-24 cement plants, the European cement industry is one of the most concentrated in the world. It should be noted that, in general, investments in new cement plants occur only seldom in Europe[264]. Furthermore, many industry representatives point out that the ability of industry to operate profitably is suffering from the current design of the EU CO_2 Emissions Trading System (EU CO_2 ETS).

6.1.2 The cement industry in Hungary

The first Hungarian production of cement as understood in the modern world started in the second half of the 19th century at Lábatlan in the north of Hungary close to the border of Slovakia[265].

Starting from the late 60s, the Hungarian cement industry was characterised by outstanding dynamic growth[266]. New plants were built in Beremend, Miskolc-Hejőcsaba and Bélapátfalva, and the plants in Vác and Lábatlan were rebuilt. At the time of writing this report, there were six cement production plants in Hungary, owned by three companies, and located in Bélapátfalva, Beremend, Vác (Heidelberg Cement), Hejőcsaba, Lábatlan (both Holcim) and Királyegyháza (Lafarge Cement)[267]. According to the Hungarian Cement Association, the cement industry ranked already very well in terms of technical as well as economic indices (such as specific heat consumption, quality and productivity) when Hungary joined the EU in 2004[268]. Overall domestic production in 2010 was around 3 million tonnes[269].

The cement production has been strongly linked to the activity of the contractors in the national construction industry. The construction industry in Hungary contributes five per cent to GDP and employs six per cent of the workforce. It is the fourth largest business sector, which has been boosted by a large number of motorway, railway and gas network infrastructure projects[270]. For example, since 1990, Hungary's motorway network has increased fourfold with a strong impact on the demand for concrete and cement.

The recent global recession led to a considerable decrease in contractors' activity in 2009 and the Hungarian Statistical Office reported a drop in the national construction industry of around 15% year-on-year in 2010[271]. Some public and commercial projects were stopped or were on hold. Consequently, cement consumption dropped by around 22% year-on-year in 2010[272]. This left the country in a situation of overcapacity.

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[262] CEMBUREAU (2012). Cement industry – Main Characteristics. Available at: http://www.cembureau.be/about-cement/cement-industry-main-characteristics, accessed on: July 25, 2012.

[263] Selim, T.H. and Salem, A.S. (2010). "Global Cement Industry: Competitive and Institutional Framworks." The American University in Cairo. Available at: http://mpra.ub.uni-muenchen.de/24462/.

[264] ICR Research (2011). "Europe's youngest cement plant". Available at: http://www.cemnet.com/Articles/story/39898/europe-s-youngest-cement-plant.html

[265] It may be worth noting that Holcim's Hungarian subsidiary Holcim Hungaria Zrt plans to close this plant in 2013. Holcim Hungaria Zrt originally planned to shut the 144 year-old plant by 2010 but its lifetime had previously been extended by environment friendly investments of almost Euro1.76m to 2016. In a press release the company blamed the downturn of Hungary's construction industry for the anticipated foreclosure. Retrieved from "Holcim shutters Lábatlan factory". Available at: http://www.realdeal.hu/20121009/holcim-shutters-cement-factory-in-hungary/

[266] It should be noted that no data was found to illustrative this point, which refers back to a period where statistical data in Hungary was not widely collected and made available

[267] Cemnet (2012) Global Cement Report. Available at:.

[268] Hungarian Cement Association (MCSZ). Cement production in general. http://www.mcsz.hu/en/index.php?menu=2&oldal=5.

[269] USGS Cement statistics and information (2011). Minerals Yearbook 2010.

[270] Borostyankoi, M. (2011). Report on the Hungarian Construction Industry 2011. Available at: http://www.congrex.ch/fileadmin/files/2011/fidic2011/downloads/Matyas_Borostyankoi_AHCEA_FIDIC_DNS_2011.pdf

[271] Retrieved from the datasets made available by the Hungarian Central Statistical Office. Available at: http://portal.ksh.hu/pls/ksh/docs/eng/xstadat/xstadat_annual/i_oe002.html.

[272] CEMBUREAU (2011). Key fact & figures. Available at: http://www.cembureau.be/about-cement/key-facts-figures.

6.2 Selected sample of investment projects

This second section looks at the sample of projects selected for the analysis. It starts with a brief description of each project and then describes the main characteristics of the selected sample. Finally, the grants scheme is described.

6.2.1 Overview of projects

The case study on the cement industry in Hungary consists of two projects: the investment by Nostra (which belongs to the French Lafarge) and the one by the Swiss company Holcim.

Table 19: Projects in the case study on the Cement Industry in Hungary[273]

Beneficiary	Region	Instrument	Aid amount (m€, nominal)	Max. aid intensity allowed	Aid intensity awarded
Holcim	Komárom-Esztergom	Tax credit	37.5	n/a	22.5% NGE
Nostra Cement	Baranya	Tax relief	12.6	29.30%	7.5% GGE

NGE: Net Grant Equivalent; GGE: Gross Grant Equivalent

Holcim: Holcim is a worldwide top producer of cement, concrete and aggregates with 51,133 employees for 153 plants[274].

Holcim proposed to replace an existing 140 year old plant with a new, bigger one with modern technology to improve productivity and increase production capacities. As the old location could not be expanded, Holcim chose a new location at Nyergesújfalú, a few kilometres away from Lábatlan, near to the same limestone deposit. The new plant was planned to have a capacity of 1.8 million tonnes per year. The amount of the investment was HUF 40 billion (€153 million).

Holcim started preparatory construction works in 2008. It had to stop in 2009 as the building permit was suspended following an appeal by environmental groups and surrounding municipalities. The case had not yet been settled at the time this report was written. A further revision of the investment decision by the company cannot be ruled out: as a result of the drop in building activities in Hungary of 50% between 2007 and 2011, Holcim has already had to cut employment at the old facility from 228 to 100, while Holcim's project was still on hold at the time of writing this report due to environmental issues.

Nostra: Nostra belongs to Lafarge, the world leader for cement production, the second largest producer of concrete and the fourth largest producer of aggregates, with 166 plants all over the world and 66,600 employees.

Nostra built a new cement plant in Királyegyháza, Co. Dél-Dunántúl to reorganise raw material supply, improve productivity and increase market share in an emerging market. The plant has a capacity of 1 million tonnes per year. The project entailed an investment of HUF 72 billion (about €270 million).

The project was started in 2003 by Nostra's former owner Strabag. The construction began in 2007 and was completed in 2011. The production capacity of the new plant is 1 million tonnes of cement and 750 thousand tonnes of clinker per year. It is the first new cement factory built in Europe in about 30 years.

[273] Source: European Commission, State Aid Register (http://ec.europa.eu/competition/state_aid/register/)

[274] HOLCIM Ltd. Annual Report 2010. Available at: http://www.holcim.com/fileadmin/templates/CORP/doc/AR10/AR2010_Preprint_EN.pdf

6.2.2 Main characteristics of the projects

Both projects are classified as initial investments. Nostra's investment is a "true" Greenfield investment[275] (new establishment) inasmuch as it had no pre-existing operations in Hungary before the investment, and the project involved the exploration of a new site for raw material. Holcim's planned investment would replace one of its existing plants, which is much smaller and older. Since the company does not consider sensible to expand the old location, it chose a new location at Nyergesújfalú.

As will be seen in section 6.3.1.1, both investment projects were a response to the then growing demand in Central and Eastern Europe and aimed at increasing production capacity.

6.2.3 State aid scheme and the selection of projects

6.2.3.1 Presentation of the aid scheme

Both projects in scope of this case study qualified for aid awarded under the scheme N 651/2006[276] "Development Tax Benefit", covered by the General Block Exemption Regulation. This is a tax incentive scheme aiming at boosting productive investments in the assisted regions of Hungary.

The beneficiaries of the scheme are all types of enterprise that invest in Hungary's assisted areas of Hungary. The aid is awarded for initial investment projects and for job creation linked to initial investments in the form of a tax credit (deduction from corporate income tax). The scheme provides aid in all sectors of the economy, with the exception of the products of fishery, coal, steel, shipbuilding and synthetic fibre industries.

6.2.3.2 Projects evaluation

The following investment projects are eligible for aid:

- Investments of at least HUF 3 billion (approximately €11.5 million) (HUF 1 billion in less developed regions), which meet any of the following requirements during the four years following the first year in which the tax relief is utilized:
  - increase in the average number of persons employed should be at least 150 (75 in less developed regions), or
  - increase in the taxpayer's annual wage costs by at least 600 times the valid minimum wage calculated for the tax year (300 times in less developed regions).

- Investments of at least HUF 100 million (approximately E€385,000) which meet any of the following requirements:
  - projects bringing an existing food facility producing foodstuffs of animal origin into compliance with statutory requirements on food hygiene,
  - environmental protection (as defined in the Hungarian law on environmental protection),
  - broadband internet service projects,
  - R&D investments (relating to fundamental, industrial or pre-competitive research) undertaken on premises managed by the Hungarian Academy of Sciences or higher education institutions or research institutes established by a central budgetary organisation.

- Investments which create a certain number of additional jobs (300 for large enterprises, 150 for medium-sized and 30 for small companies, with lower numbers in less developed regions) and where at least 20 percent of the newly hired workforce are "first-time employees". There is no accompanying eligibility requirement on the amount invested.

[275] OECD-IMF (2004). "Greenfield investments: creation of a subsidiary from scratch by one of more non-resident investors". Available at http://www.imf.org/External/NP/sta/bop/pdf/diteg42829.pdf

[276] The scheme has been running from 01.01.2007 to 31.12.2013, with a total budget of HUF 140 million (approximately €540 million). The summary information sheet was published in OJ C 152, 6.7.2007).

The tax deduction is always granted if the criteria are met, regardless of the details of the particular case. Aid cannot be refused once the conditions under the scheme are fulfilled. This means inter alia that the incentive effect of the aid is neither verified nor part of the decision-making process for granting aid for particular cases.

6.2.3.3 Aid amount and intensity level

The amount of the aid is calculated by reference to either material or immaterial investment costs resulting from the investment project or to wage costs for jobs linked to the investment project.

The maximum aid intensity permitted does not exceed the applicable regional aid ceiling determined in the regional aid map for Hungary. The maximum permitted aid intensity established by the scheme for large enterprises varies in the abovementioned map from 25%-50% Gross Grant Equivalent until 2010 and from 10%-50% Gross Grant Equivalent from 2011-2013, depending on the region where the initial investment takes place[277].

6.3 Determinants of investment and location decisions

6.3.1 Determinants of investment decisions

6.3.1.1 Main determinants of investment decisions other than regional aid

According to the evidence collected, both investments were determined by the following factors:

Growing demand: The investment projects aimed to respond to growing demand for cement caused by an increase in construction activities in Central and Eastern Europe. The market was growing and competitors in the cement industry were investing as well.

Need to increase efficiency: In this context, investors were not only seeking increased capacity, but also enhanced productivity. Both Holcim and Nostra took this opportunity to introduce new production technologies and reorganise raw material supply in order to increase production capacities and productivity.

6.3.1.2 Incentive effect of the aid on the investment decision

The aid did not influence the decision to invest, and the same investments would have been made without any state aid. One beneficiary explained that the aid is seen rather only as a welcoming “gesture” by the government.

As the aid was granted under an existing scheme, the projects were not considered in detail by the Granting authority. The formal conditions were fulfilled and thus the aid granted. Therefore, the Granting authority did not examine whether the aid had an incentive effect or not, and could not determine what would have happened if no aid had been offered.

6.3.2 Determinants of location decisions

Several factors influenced the beneficiaries’ location decisions, including the state aid. First, the factors other than state aid are presented and then the role of the aid is discussed.

6.3.2.1 Main determinants of location decisions other than regional aid

In the Nostra and Holcim projects, the following location factors were identified:

Availability of raw material: In the case of the cement industry, the availability of limestone is a necessary condition for establishing a new cement production plant.

Proximity to markets: Furthermore, because of the significantly high transportation costs, plants need to be built in proximity to the target markets.

[277] N 651/2006 – Development tax benefit – Hungary, European Commission 2007.

Transport and accessibility: Following the same rationale as above, adequate accessibility in terms of transport infrastructure is also a requirement, in order to control costs.

6.3.2.2 Incentive effect of the aid on the location decision

Alternative locations

According to the interviewees, several specific locations in close proximity to the sites detected for raw material were considered, but no alternative locations were looked at in Hungary or abroad.

As said, only locations close to a deposit of limestone and in proximity to the end market were considered. Holcim, for example, had a pre-existing production plant in Lábatlan, but the old plant could not be expanded. Hence, Holcim looked for a location near the existing one, in order for the new plant to be supplied from the same limestone quarry.

Figure 26: Distance from the previous Holcim plant and the new selected location

Nostra needed to find somewhere suitably close to raw material and where the required permits could be obtained without too much delay. Nostra considered 13 possible locations situated within a radius of ca. 35-40 km, in the county Baranya, where all major raw materials (clay and dolomite) can be found. Initially, the municipality of Bükkösd in Baranya where the quarry is located was chosen, but the investment was initially turned down on environmental grounds. Although Bükkösd revised its position at a later stage, Nostra did not want to delay construction any longer and explored possibilities at two alternative sites, namely Királyegyháza and Kővágószőlős. It then finally decided on Királyegyháza.

Incentive effect of the aid

For the reasons mentioned above, the aid was not an incentive for the investment location. The location decision was rather based on a strategic calculation of transport and raw material costs, as well as a proximity to markets.

6.4 Benefits of the investment

As already described in section 6.2.1 above, Nostra's project was completed as planned while Holcim's project was stopped. Nostra's investment generated 132 new jobs. Nostra invested in one of the less-developed regions of Hungary, where unemployment levels are high (around 20%) and the average level of qualifications is very low. According to the beneficiary, the region benefited to a high extent from its investment, since it is estimated that less than 5% of the new employees were brought to the region as expatriates, while more than 80% live within a 50 km radius around the site.

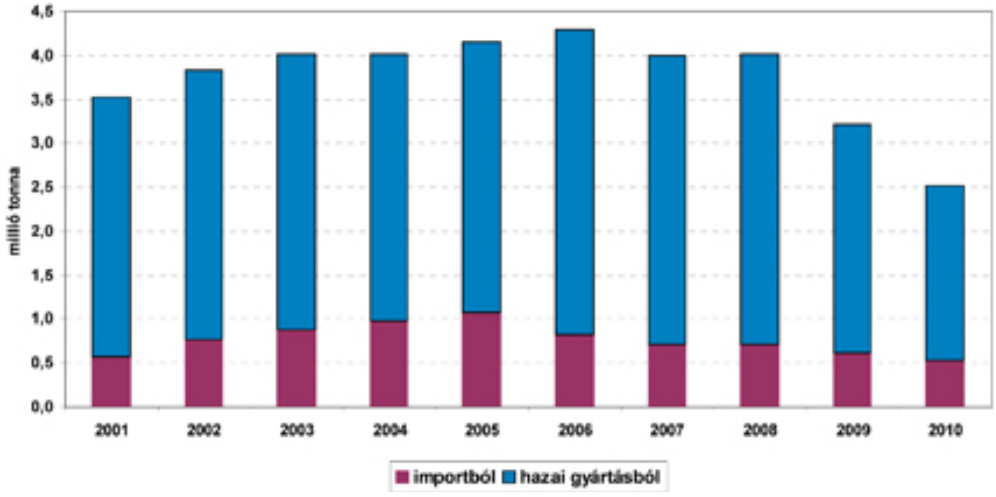
The jobs created by Nostra's investments in the cement facilities mainly required a low level of qualifications, and the investment did not entail specific measures in terms of training or R&D. According to the beneficiary, about €100,000 are spent annually on training for the newly hired work force, which is still quite significant compared to other projects in the sample (no intra-sectoral comparison was possible).

There are also positive impacts to be seen on job creation in the surrounding region. According to Nostra, once operational, the project generated 300 indirect jobs. However, no concrete evidence of spill over effects could be observed, and it is not expected that suppliers will settle around the location of the cement factory.

6.5 Impact on competition

There are not enough data available on the cement market in Hungary to conduct a thorough analysis of the possible concerns about competition that aided investment schemes could have risen there. Nonetheless some information can be collected on the level of concentration and on the efficiency of the market in which the companies considered conduct their business. It is importance to recall that the market considered is the Hungarian one, or at best, the southern EEC one, because of the high transportation costs of the product. This is shown also by the graph below, illuminating the small share of imports in the overall cement consumption in Hungary.

Figure 27: Hungarian consumption of cement (imported and internally produced cement, in million tonnes)[278]



6.5.1 Potential distortion due to excessive market power

As already said previously in this report, the European cement industry is *highly concentrated*, with the five largest European companies accounting for more than half the total cement output in EU-25 in 2003 and each comprising 23-24 cement plants.

The level of concentration of the cement market in Hungary can be retrieved from the analysis of an acquisition case occurred in 2009. The Hungarian competition authority (GVH) investigated a case of acquisition by Holcim of the Slovak company VSH, already producing cement in Hungary. According to the GVH, even with Lafarge's acquisition of Nostra Cement from Strabag, the business of cement in Hungary was still basically highly relying on two major companies. Apparently, taking into account the economical distance of cement transportation (approx. 300 km) and the geographical position of the Hungarian cement factories, the Holcim and Heidelberg groups alone would theoretically be able to supply the whole country. Besides, the investigation of the GVH revealed that Holcim predominantly supplies the eastern part and Heidelberg the

[278] Hungarian Cement Association (MCSZ) 2011. "Efforts of the Hungarian Cement Industry". Available at: http://www.mcsz.hu/en/index.php?menu=2&oldal=4

western part of Hungary thus producing a geographical divide of the market into influence spheres.

The authority has reached the conclusion that without the competitive pressure exercised by VSH, Holcim would be able to increase the price of cement by 5-10% without any loss in its profits; moreover, *a small increase in the price of cement would make it more difficult for a new player to enter* the ready-mix concrete market. Based on the foregoing, Holcim would have been in a position to foreclose its rivals[279].
This outcome was avoided thanks to some covenants imposed on Holcim, but still the possibility of tacit collusion persists.

Furthermore, the sector is also characterized by *high entry barrier*: the cement industry is one of the most capital-intensive industries and its investments are amortised only over long time periods. The costs of building a new cement plant are usually equivalent to around three years' aggregate turnover. In this context, investments in new cement plants occur only seldom in Europe.

In this context, it is possible to challenge the suitability of the decision granting access to the aided investment scheme to Holcim and Nostra (Lafarge), two of the worldwide top producers of cement, concrete and aggregate.

6.5.2 Potential distortions due to market inefficiencies

At world level, the cement market is on *blatant overcapacity*, as analysts like Fitch have been stating[280]. As reported above, the situation is not different at regional level. The recent global recession led to a considerable decrease in the national construction industry, and the cement consumption dropped by 20% in 2010, leaving the country in a situation of overcapacity.

According to one industry representative interviewed, the southern region of Hungary currently has the highest overcapacity in Europe, while at the same time the market has been shrinking. Thus, cement plants in the region are momentarily operating at around 50% of their production capacity and barely reaching break-even despite efficient cost structures. The situation was also confirmed by one of the competitors interviewed. *The market is thus underperforming* and any further investment meant to increase capacity is likely to distort it. Moreover, since there is almost no room for export due to physical limitations, there is no possible alleviation for this dysfunctionality[281].

6.5.3 Effects of aid for competitors

The analysis of the market power of the two beneficiary companies – both in terms of dominant position and entry barriers – and the presence of market inefficiencies at the time of completion of the one investment that proceeded as planned, indicate that the state aid had potential negative impact on competition.

Interviews with two competitors provide with mixed evidence[282]. The first competitor was not concerned about any impacts from the state aid and the aided investments, mainly because of the cement industry operates mainly locally as transport costs are high. Thus, any company operating further than 150-250 km away is not considered a direct competitor by the interviewee.

The perspective of the second interviewee was quite different. The company operates a cement plant around 20 km from Nostra's new plant. The competitor stated that against the background

[279] OECD (2010). Annual Report on Competition Policy Developments in Hungary. Available at: http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=DAF/COMP/AR(2011)27&docLanguage=En

[280] http://www.accessmylibrary.com/article-1G1-246169398/overcapacity-exert-further-pressure.html

[281] Hungarian Cement Association (MCSZ) 2011. "Efforts of the Hungarian Cement Industry". Available at: http://www.mcsz.hu/en/index.php?menu=2&oldal=4

[282] To assess the potential impact on competition, representatives of Kirchdorfer Zementwerk and Heidelberg Cement were consulted (a total of 9 competitors were approached)

of overcapacity reaching levels higher than anywhere else in Europe and operations within a declining market at the time of the operating phase of Nostra's aided project, the investment severely impacted its operations. The competitor indicated that the investment resulted in considerably reduced turnover and profitability for them. Furthermore, Nostra tried to entice employees away during the investment phase. In order to avoid this, the competitor had to raise salaries for their staff. Additionally, the new plant impacted demand as Nostra's owner Strabag vertically integrated cement production into their Hungarian operations. Unfortunately, this information could not be triangulated with further evidence.

Finally, it should be noted that both competitors did not consider the granting of aid to be market-distorting, because they recognise that Nostra's investment would have probably taken place anyway.

6.6 Conclusion

As far as the case study on the Cement Industry in Hungary is concerned, the following conclusions can be drawn:

Determinants of investment or location decisions of the aided firms
The investment decisions were influenced by growing demand due to the growth in construction activity on the local markets, as well as the seeking for productivity gains. According to the evidence collected, the state aid did not influence the investment decisions.

The location decisions were determined by the availability of raw material and the geographical proximity to the markets, due to the high transportation costs in the sector. Several specific locations in close proximity to the sites detected for raw material were considered, but no alternative locations were looked at in other region in Hungary or abroad. Hence, the state aid did not influence the location decisions.

Consequences of the investments in terms of regional and employment benefits and externalities
The completed project (Nostra's new cement plant) has been beneficial for the region in terms of direct and indirect jobs. It was not possibly to identify any other positive impacts (e.g. in terms of knowledge transfer, quality of jobs or spill over effects).

Hence, the state aid did not generate sufficient incentive effect or impact that could justify the public expenditure. Given the fact that the cement industry depends to a very large extent on market dynamics in the construction sector, and that transport costs in the cement sector are very high (meaning that the agglomeration forces are low), these observations could have been anticipated by the granting authority. However, the aid was granted under rather loose terms of reference and its potential incentive effect were not assessed to the best extent possible. The granting authority itself acknowledged that, as long as they generate jobs, all investment projects are treated equally.

The distortive effects of aid for competitors and/or other regions
In addition, the evidence collected on the market and competitors highlights high risks of negative impacts of the aid on competition. The analysis of the market indicates that both beneficiaries benefit from rather dominant market positions and entry barriers that prevent other companies to compete on the local and global markets. In addition, at the time of completion of the one investment that proceeded as planned, the cement market in Hungary was in absolute decline and was experiencing overcapacity.

Evidence collected from one competitor also indicates that Nostra's investment affected competition in the region: local cement plants have been competing on the job market locally and salaries have increased; in addition, with the market downturn, the new investments have meant overcapacity locally.

7. PULP AND PAPER INDUSTRY – SPAIN/PORTUGAL

This sixth case study looks at the paper sector in Spain and Portugal. It is based upon an assessment of five investment projects.

7.1 Background

This section introduces the pulp and paper industry before setting out the development of this sector in Spain and Portugal. Global market trends are outlined in order to understand the position of the European industry and the process of consolidation it has been undergoing over the last two decades in particular.The chapter then goes on to focus on Spain and Portugal to better contextualize the conditions of the market in which the projects of the sample are carried out.

7.1.1 Introduction to the paper industry

"Pulp and Paper Industry" is the general sector definition given to the organisations connected to production of pulp for papermaking, paper and board of different types. The activities of this industry extend to most of the life-cycle of paper products, ranging from the production of raw materials (forest production) to the processing of products at the end of the life-cycle (through recycling or energy production using recovered paper). The main activity of this industry relates to the various stages of the paper production process, beginning in wood production, its harvest and manufacturing of pulp for papermaking and finally the manufacturing of different types of paper and board[283].

The economic development of the pulp and paper sector over the last decade has been dynamic. According to the Confederation of European Paper Industries, paper and board production in Europe increased gradually until 2007 before demand within the sector was impacted by the economic and financial crisis of 2008, which caused a sharp decrease in paper production and a significant decline in companies' profits. The sector began to recover in 2010 and experienced a sharp improvement in profitability. However, production and consumption of paper has not yet returned to pre-crisis levels and investment is below that of previous years.

While Europe is a net exporter of paper and board, mainly to Brazil, China, Russia, Turkey and the U.S., Europe is a net importer of pulp, mainly from Brazil, Canada and the United States[284]. Europe produced in 2010 the 20.9% of the pulp and the 24.5% of the paper and board, absorbing the 24.6% of the global pulp production and the 21% of the paper and board[285].

European companies face increased competition from Brazil in pulp and from China in paper and board production. Due to extensively subsidised investments in China in recent years, the average age of its paper machines is now lower than that of those in Europe while average size is larger. In a 15-month investigation, the EU established that the Chinese government subsidised

[283] CELPA (2009). Statistics Report. Portuguese Paper Industry. Available at/ http://www.celpa.pt/images/pdf/art209_en_be_2008.pdf.
[284] CEPI (2012).Sustain. CEPI's online Sustainability Report. Economy and Competitiveness. Available at: http://www.cepi-sustainability.eu/economy-competitiveness.
[285] CEPI (2011). European Pulp and Paper Industry. Key statistics 2011. Available at: http://www.cepi.org/topics/statistics

its paper industry by providing cheap loans, allocating land below market value and granting various tax incentives which are illegal under World Trade Organisation (WTO) rules. Since 2011 the European Union has responded to this situation by imposing final countervailing duties on these imports that range from [4-12]% on high quality paper and anti-dumping duties ranging from [8-35.1]% on coated fine paper from China[286].

At a broad economic level pressures have affected the whole industry with its value as a global commodity falling alongside the challenge of investing at a time of increasing costs (especially for energy, chemicals, etc.). Further challenges include investment cycles of up to 50 years as well as the development of new types of products such as bio-fuels from the waste of cellulose production [287].

7.1.2 The paper and pulp industry in Europe

The pulp manufacturing industry in Europe consists for the most part of large and very large firms, often multi-nationals, which are frequently involved with paper operations. They are very capital-intensive industries, as a new state-of-the-art pulp mill costs around €1 billion, or even more if it is part of a paper mill. Paper mills for "commodity grades" of paper, i.e. those intended for further cutting into sheets or rolls or subsequent conversion into products, are most often also large or very large and also quite capital-intensive, especially if there are several paper machines on one site. Conversely, most converting mills, i.e. those producing usable paper products, are SMEs.

The value chain of the paper industry in Europe can be split in three parts, accounting for very different shares of value added and employment. For instance, DG Enterprise and Industry estimated that in 2006, "pulp manufacturing" represented 5% of added value and 2% of employment, "paper manufacturing" 39% and 29% and "articles of paper and paperboard" 56% and 69% respectively[288].

Since the beginning of the 90's, the industry has been restructuring[289]. Whilst production has been increasing gradually, employment has been decreasing. In Europe during the period from 1991 to 2010[290] production of pulp increased from approximately 34 million tonnes to 39 million tonnes and production of paper and board from about 66 million tonnes to about 97 million tonnes. At the same time employment decreased from about 435,000 to 224,000 employees. This reflects continuous improvements in productivity where growth in demand has been matched or exceeded by improvements in productivity. The number of companies in the sector has also fallen decreasing from 1,052 in 1991 to 655 in 2011[291].

[286] Communication Department of the European Commission (2011). "EU imposes first ever anti-subsidy tariffs against imports from China". Available at: http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/568&format=HTML&aged=0&language=EN&guiLanguage=en, accessed on: 08/02/12

[287] CEPI (2012). Sustain. CEPI's online Sustainability Report. Economy and Competitiveness. Available at: http://www.cepi-sustainability.eu/economy-competitiveness.

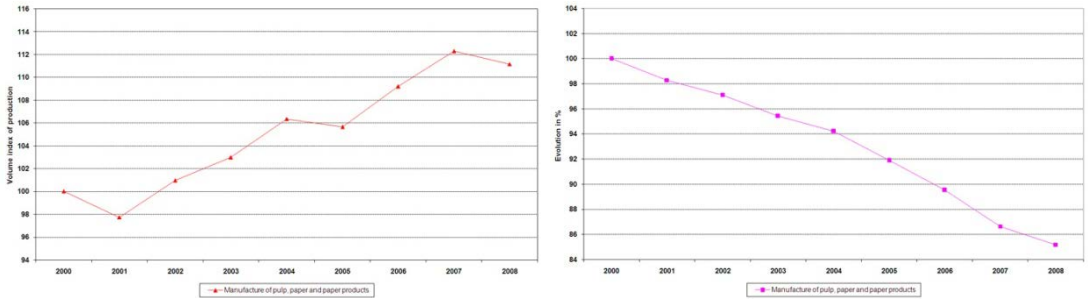
[288] Pulp and Paper Industry, competitiveness. Available at: http://ec.europa.eu/enterprise/sectors/wood-paper-printing/paper/competitiveness/index_en.htm

[289] Sande, J. B. (2002). "Restructuring and globalization of the forest industry: review of trends, strategies and theories". UNECE-FAO Papers. Available at: http://www.unecefaoiufro.lsu.edu/marketing/documents/2003-2006/gme03_044.pdf

[290] EU-27 plus Norway and Switzerland.

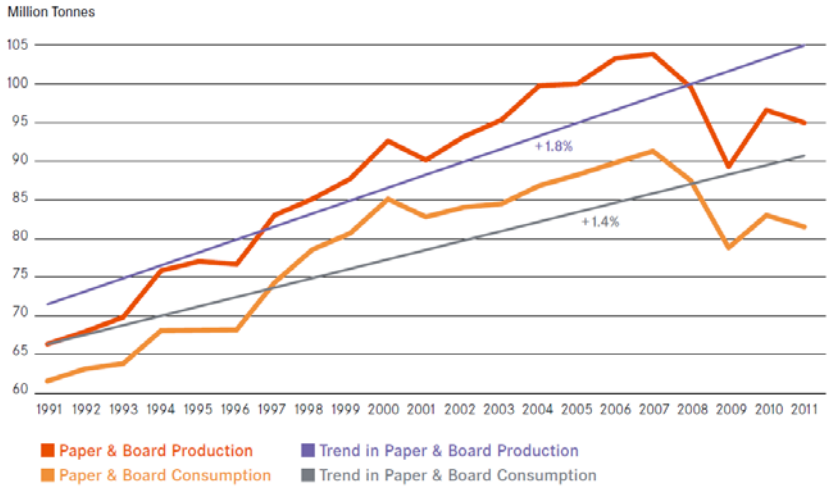
[291] CEPI (2011) European Pulp and Paper Industry. Key statistics 2011. Available at: http://www.cepi.org/topics/statistics

Figure 28: Opposite trends, growing output (left) and shrinking labour intensity (right) in the pulp and paper industry[292]



The two graphs above illustrate clearly the two main trends that the European paper industry is undergoing: growth in productive capacity and production over the past ten years, combined with shrinking employment levels. Productive capacity, albeit growing on the long run, is under pressure due to persistent overcapacity issues in the European industry, as it is demonstrated in Figure 36. Overcapacity within the EU market should however be balanced by the growth of foreign markets and exports, especially to Asia.

Figure 29: Paper consumption and production capacity in the EU[293]



7.1.3 The paper and pulp industry in Spain and Portugal

The paper and pulp industry is of great economic importance to Spain and Portugal. According to the Portuguese Paper Industry Association (CELPA), the pulp and paper sector is a net exporter and contributes strongly to Portuguese economic growth, up to 3.6% of the value of Portuguese export[294]. The pulp and paper sector is the fourth largest net exporter in the national economy of Portugal, behind the textile, leather and wood industries. The main destinations of pulp and paper sales are European countries. The main pulp markets are Germany, Spain and Portugal itself. Paper sales are focused on Portugal, Spain, Germany, France and Italy.[295]

According to the Association of Spanish Pulp, Paper and Board Makers (ASPAPEL), the pulp and paper sector is represented in Spain by 12 pulp mills, and 83 paper and paperboard plants. In 2010, these mills and plants produced 7.4 million tonnes of output, split between 1.7 million tonnes of pulp and 5.7 million tonnes of paper and cardboard. In 2009, Spain ranked sixth in

[292] European Commission, DG ENTR (2012): Wood, Paper, Printing; Pulp and paper: competitiveness. Available at: http://www.cepi.org/topics/statistics

[293] CEPI (2011) European Pulp and Paper Industry. Key statistics 2011, p.12. Available at: http://www.cepi.org/topics/statistics

[294] Hausmann, R. (2011). The Atlas of Economic Complexity. Puritan Press. Cambridge MA.

[295] CELPA (2012)."The Sector's Importance". Available at: http://www.celpa.pt/index.php?id=5&language=EN

Europe in production capacity behind Germany, Finland, Sweden, Italy and France and ahead of the United Kingdom. In the same year, the monetary value of this output was €3.4 billion. The industry employs 17,400 people directly. Geographically, Aragón is the leading region in paper production within Spain. The output of Aragón's pulp and paper industry accounts for 26% of the national total. The region is followed by the Basque Country (19%), Catalonia (15%), Andalusia (10%), Galicia (5%), Madrid (5%) and Asturias (5%), and finally Castilla Leon and Valencia.[296]

The requirement to respond to increasing competition and technological developments were identified as major investment drivers in Spain and Portugal and these have been reflected in the investment projects described below.

7.2 Selected sample of investment projects

This second section looks at the sample of projects selected for the analysis. It starts with a short description of each project and then describes the main characteristics of the sample selected. Finally, the aid scheme and the selection process are described.

7.2.1 Overview of projects

This case study builds on a sample of five investment projects from the years 2002 to 2007.

Table 20: Projects in the case study on the Pulp and Paper Industry in Spain and Portugal[297]

Beneficiary	Region	Instrument	Aid amount (m€, nominal)	Max. aid intensity allowed	Aid intensity awarded
Papelera Guipuzcoana de Zikuñaga (PGZ)	Guipúzcoa (Spain)	Direct grant	4.2	17,7% NGE	4.8% NGE
Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	Zaragoza (Spain)	Direct grant	12.8	11,9% GGE	7.9% GGE
Portucel - About the Future	Península de Setúbal (Portugal)	Tax allowance	38.0	8,3% NGE	7.0% NGE
Celulose Beira Industrial (Celbi)	Centro – Baixo Mondego (Portugal)	Tax allowance Soft loan	59.3	20,2% NGE	18.6% NGE
Papeles y Cartones de Europa (Europac)	Palencia (Spain)	Direct grant	13.5	n/a	18.0% GGE

NGE: Net Grant Equivalent; GGE: Gross Grant Equivalent

Papelera Gipuzcoana de Zikúñaga: Papelera Gipuzcoana de Zikúñaga is an integrated pulp and paper producer. The investment project aimed at increasing the production capacity of pulp from 100,000 to 175,000 tonnes/year and meeting higher environmental standards. The investment was connected to other investments in subsequent paper production capacity and in power generation facilities. Before the investment project, pulp was acquired from outside suppliers but following the investment the production of pulp was brought in house.

The plant is located in Hernani in the Basque Country (Spain). The granting authority responsible was the Basque Government. The investment project ran between 2000 and 2002. It was fully completed.

[296] ASPAPEL (2012) .The Sector - Description http://www.aspapel.es/en/the-sector/description.

[297] European Commission. State Aid Register. Available at: http://ec.europa.eu/competition/state_aid/register/

Sociedad Anónima Industrias Celulosa Aragonesa (SAICA): SAICA produces corrugated cardboard from paper. The project in scope of this evaluation involved extension of an existing site. A new plant called "SAICA-4" was built next to the existing SAICA-2 and SAICA-3 plants. Inter alia, the project entailed installation of a new machine for processing recycled paper and a combined cycle power plant. The investment project was completed in 2006.

The project is located in El Burgo del Ebro in the Zaragoza region (Spain). The granting authority responsible was the Aragón Government.

About the Future – Empresa Produtora de Papel S.A. (Portucel): Portucel is an integrated pulp and paper producer. The investment involved setting up a new uncoated wood-free paper production plant, with a total capacity of 500,000 tonnes/year. The new paper plant complements the existing paper plant. Before the investment, Portucel's pulp production capacities were larger than its paper production capacities. The surplus pulp was sold on the market. This investment aligned Portucel's paper production capacities with the existing pulp production capacities.

The plant is located on Peninsula de Setubal (Portugal). As in the case of Celbi, the granting authority was the Portuguese Business Development Agency (AICEP). The work on the investment started in May 2006, and it was completed in 2010.

Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel S.A: Celbi produces pulp. It is a non-integrated producer and thus sells its production on the market. Celbi belongs to the Altri Group. The investment project involved the modernisation and extension of the existing bleached eucalyptus craft pulp production facilities. According to the beneficiary, the best technology available was installed at the different steps of the production process. The production capacity increased from 310,000 tonnes/year to 550,000 tonnes/year.

The project is located in Figueira da Foz in the Centro-Baixo Mondego region (Portugal). The granting authority responsible was the Portuguese Business Development Agency (AICEP). The investment period ran from 2007 to 2009, and the project was fully completed.

Papeles y Cartones de Europa S.A. (Europac): Europac produces paper and cardboard. It is a multinational industrial group with production sites in Spain, Portugal and France. The investment project concerned the technological modernisation of an existing plant. Several components of the production facilities were replaced by more modern components. The aim was to improve paper production capacity and the quality of the paper produced.

The plant is located in Dueñas (close to Palencia) in Castilla-León (Spain). The granting authority responsible was the General Secretary for Regional Incentives and the Innovation and Financing Agency of Castilla-León. The investment project was fully completed.

7.2.2 Main characteristics of the projects

The project sample includes only re-investment at existing operational sites.

All projects evaluated involved the acquisition and installation of new industrial equipment in order to replace obsolete equipment and increase production capacities. However, the projects evaluated varied, as in two cases (Celbi, Papelera Guipuzcoana) the production increase was in pulp and in three cases (Portucel, SAICA, Europac) it was in paper. The increase on pulp production for the Papelera Guipuzcoana was however instrumental to an internal upstream verticalizing strategy, so that only Celbi's investment is relevant to the Pulp market as such.

In all projects the new investment provided the opportunity to introduce new technologies for efficiency gains, not only through increased productivity, but also through the introduction of new approaches. This includes the implementation of integrated pulp (intermediary product) and paper production capacities, as well as the installation of a combined cycle power plant that has the capacity to supply the production plant with energy.

Four projects also included the extension of the production site through the construction of new buildings, e.g. for the preparation and storage of chemical additives, storage of final products etc.

In order to train the workforce for the utilisation of the new equipment and techniques, all projects also included human investment components.

7.2.3 State aid schemes and the selection of projects

7.2.3.1 Presentation of the aid schemes in Spain

In Spain, the aid was awarded at regional level by regional granting Authorities.

The aid to SAICA was awarded by the Aragón Government. The aid was originally considered to constitute an individual case of application of the State aid scheme N 13/2000 approved under the General Block Exemption Regulation[298] and was thus awarded without notification to the European Commission. However, the European Commission indicated that the measure did not come under this scheme since this scheme is applicable exclusively to small and medium-sized enterprises, whereas SAICA is a large firm. As a consequence, the aid was considered to have been awarded unlawfully, and the Spanish authorities had to notify the case to the European Commission and demonstrate compatibility with the provisions of the "Multi-sectoral framework on regional aid for large investment projects" (MSF) [299]. The Commission eventually decided that the aid did not pose a problem of compatibility with the common market and accordingly decided to consider the aid to be compatible under Article 87(3)(c) of the EC Treaty.

The aid to Europac was awarded by the General Secretary for Regional Incentives and the Innovation and Financing Agency of Castilla-León under the existing regional aid scheme XR 57/2007 “Regional Incentives” approved by the European Commission under the General Block Exemption Regulation[300].

The aid to Papelera Guipuzcoana was awarded by the Basque Government as an “ad hoc aid”. In accordance with the RAG, it was notified to the European Commission by the Spanish authorities, which had to demonstrate its compatibility with the EC Treaty.

7.2.3.2 Presentation of the aid schemes in Portugal

In Portugal, the aid was awarded at national level by the Portuguese Business Development Agency (AICEP). Both investment projects where financed by existing regional aid schemes approved by the European Commission under the General Block Exemption Regulation. However, both projects also pertained to the “‘large investment project” category as defined by the RAG; for this reason, the Portuguese authorities had to demonstrate compatibility of the regional aid with the provisions of the EC Treaty[301].

In the case of Celbi, the regional aid was awarded under the regional aid schemes N 97/1999[302] "Fiscal aid scheme for investment" (tax credit) and N 667/1999 "Measure 1.2. of the Operational

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[298] “Aragón– Ayudas a las PYMEs” with as legal basis the “Decreto del Gobierno de Aragón sobre ayudas económicas a las pequeñas y medianas empresas en la Comunidad Autónoma de Aragón” (Decree of the Government of Aragon for economic aid for small and medium enterprises in the Community of Aragon). It is a multi-sectoral aid scheme to promote the development of industrial activities by SMEs, running from 2000 to 2006, with a total budget of €120.2 million (the information notive was published in OJ C 217, 29.7.2000)

[299] The same provisions as those set out by Section 4.3 or the RAG (see above) applied under the Communication from the Commission (2002/C 70/04) Multisectoral framework on regional aid for large investment projects.

[300] “Incentivos Regionales” is a multi-sectoral regional investment scheme running from 01.01.2007 to 31.12.2013, with a total budget of €298 million (the information notice was published in OJ C 196, 2.8.2008).

[301] Section 4.3 “Aid for large investment projects” of the Guidelines on National Regional Aid for 2007-2013 (2006/C 54/08) stipulates that the Member States should demonstrate that “the aid beneficiary accounts for more than 25% of the sales of the product(s) concerned on the market(s) concerned before the investment or will account for more than 25% after the investment, or the production capacity created by the project is more than 5 % of the market measured using apparent consumption data for the product concerned, unless the average annual growth rate of its apparent consumption over the last five years is above the average annual growth rate of the European Economic Area's GDP”. The same provisions applied under the Communication from the Commission (2002/C 70/04) Multisectoral framework on regional aid for large investment projects (section 3, and in particular point 23).

[302] Decreto-Lei 409/99 de 15 de Outubro – regulamenta a concessão de Benefícios Fiscais approved by the Commission on 6 October 1999 by letter SG(99) D/7974 under State aid number N 97/1999

Programme for Economic Activities"[303] (soft loan) approved by the Commission. While the tax advantage was financed by a loss in tax revenue, the financial incentive was provided by the general budget of the State and co-financed by the ERDF (European Regional Development Fund).

The aid to Portucel under the regional aid schemes N 97/1999 "Fiscal aid scheme for investment" (tax credit).

7.3 Determinants of investment and location decisions

7.3.1 Determinants of investment decisions

7.3.1.1 Main determinants of investment decisions other than regional aid

According to interviewees, the following factors influenced the beneficiaries' investment decisions.

***Need to increase efficiency*:** In all the projects, the companies were seeking to improve efficiency. As interviewees pointed out, and as confirmed by market data (see introduction above), the sector has been experiencing an increased level of competition; new international players are emerging in both the pulp and the paper markets. This competition is characterised by the setting up of large production plants, which are then benefitting from economy-of-scale effects. Therefore, the increasing competition has provided Spanish and Portuguese companies with a strong incentive to adapt and invest. Through the acquisition of modern production machinery, investors have been seeking to improve and increase their production capacity, and eventually make efficiency gains through higher productivity and economies of scale. Efficiency gains have also been expected from the internalisation of the production of intermediary products (pulp) and energy savings. For example, SAICA's investment project involved the installation of new machinery, the establishment of a new pulp preparation plant and a combined cycle power plant with the capacity to produce and cover all the power needs of the plant.

***Growing demand*:** All interviewees also mentioned the favourable market trends since the mid 90's as a key driver for investment. This growing demand stimulated the companies' investment in order to increase production volumes and maintain their position on the market and secure market shares.

***New technologies available*:** The investment decision was determined in three projects (Celbi, Europac, and Papelera Guipuzcoana) by the availability of new technologies and machines. The interviewees stressed that the sector's rate of technical evolution has sped up due to increased investments in technological innovations. This has led to increased pressure to modernise and systematically incorporate new technologies into existing installations in order to remain competitive, both in terms of productivity and the quality of the final product. This also holds true of increased energy prices and new environmental laws. These factors underpinned the companies to desire to invest in their own power plants, co-generation of energy and more environmentally friendly technologies.

7.3.1.2 Incentive effect of the aid on the investment decision

Interviewees said the determinants mentioned above were crucial in the decision to invest. All the investment projects were linked to the need for the industrial paper plants in Spain and Portugal to remain competitive although it was also apparent that market and technological developments also provided a compelling stand alone incentive to invest.

In three projects (Celbi, Portucel, Europac), the beneficiaries declared that without the state aid, the investment project would probably have been carried out on a smaller scale or would have been implemented over a longer period of time. In these cases, the financial aid supported the decision to go for a larger investment. In particular, interviewees deemed that the state aid increased the company's bargaining power vis-à-vis financial institutions with which the company

[303] Decreto-Lei No 70-B/2000 de 5 Maio approved by Commission decision of 8 August 2000 by letter SG (2000) D/106085 under State aid number N 667/1999 (the information notice was published in OJ C 266, 16.09.2000)

was negotiating investment finance. This eventually resulted in better financial arrangements for the investment.

Interestingly, the three investment projects, for which the aid had an incentive effect on the decision to invest, were awarded some of the highest nominal amounts of aid (Portucel, Celbi) or the highest aid intensities (Celbi, Europac) in the sample of 5 investment projects in the Pulp and Part Industry, as well as in the full sample of 28 investment projects across the industry case studies. This indicates a positive correlation between the aid amount/intensity and the incentive effect of the aid for the investment decision.

7.3.2 Determinants of location

7.3.2.1 Main determinants of location decisions other than regional aid

The following factors influenced the location decision of the beneficiaries:

Pre-existing operations: The presence of a pre-existing production site in the region selected was a major determinant for all location decisions. Investments in pre-existing production plants enabled efficiency gains that it would not have been possible to achieve in other locations. Moreover, in three projects (Europac, Celbi, SAICA), the proximity of the production sites to the companies' headquarters was mentioned as an important element in the location decision, inasmuch as the companies are bound by strong connections to the regional industrial base.

Transport infrastructure and accessibility*:* All interviewees emphasised that the regions selected offer advantages in terms of transport and accessibility, which influenced the location decision. Examples mentioned were well developed railways and deep-water ports, as well as logistic hubs near the production sites.

Availability of skilled labour force: All interviewees stated that the availability of human resources was an important location factor. The investments required a qualified workforce for most of the job positions. Although all companies invested in training for their employees to adapt to the new machines, it was also highly beneficial for them to have easy access to a labour force with experience in the paper sector. According to the beneficiaries, both qualitative and quantitative availability of the labour force is linked to the industrial tradition of the regions in the production of pulp and paper.

Availability of raw material: Three companies (Celbi, Portucel, and SAICA) mentioned access to timber resources as an important determinant in their location decision. For example, 70% of the raw material used by Celbi at its production site at Figueira da Foz, Portugal, is sourced domestically.

Papelera Guipuzcoana is an exception: according to the beneficiary, the greatest disadvantage of the investment location selected is the distance to the main timber production sites. The company has to ship 100% of its timber requirements from other areas of the Iberian Peninsula. This means higher transport costs compared to other production sites located closer to the forests. Nevertheless, according to the beneficiary, Papelera Guipuzcoana invested in the chosen location because of the existing operation on site and, to some extent, the availability of state aid (see below).

7.3.2.2 Incentive effect of the aid on the location decision

In three of the five projects (SAICA, Celbi, Portucel), the beneficiaries did not consider any alternative location for their investment. In these cases, it is easy to conclude that the state aid had no impact on the location decisions.

In two projects (Papelera Guipuzcoana and Europac), the interviewees claimed that the investments could have been carried out at one of the companies' other existing sites in Spain or Portugal.

As stated above, the location chosen by Papelera Guipuzcoana has the disadvantage of being distant from the main timber production sites. However, according to the interviewee, the aid

awarded to Papelera Guipuzcoana compensated for the disadvantage of the location. However, the interviewee also acknowledged that no other location was seriously considered for the investment: Papelera Guipuzcoana has other operations at other locations but they belong to other business divisions; in addition, the aim of Papelera Guipuzcoana project was to increase the production of pulp as an intermediary product to serve the production of paper on the same production site, and then to benefit from the efficiency gains generated by integrated production processes. Thus, it can be assumed that Papelera Guipuzcoana would have invested at the same location without state aid, which is consistent with the aid amount (€4.2 million) and aid intensity (4.8%) awarded, which are relatively low.

In the case of Europac, the interviewees underlined that, although the existing production site was an important factor in the location decision, an investment in other production sites of the company's group could have been a credible alternative. Europac has two other production plants in Spain, one in Portugal and one in France. Hence, the state aid, together with the support received from, and the good relationship with the regional authorities, was an important element of the location decision in favour of Castilla-León. Meanwhile, there were also other reasons for investing in Castilla-León, i.e. a favourable geographic location in terms of accessibility and natural resources, and the availability of qualified staff. Thus, the beneficiary acknowledged that they not consider other locations at any great length; according to the interviewees, the company did not compare the costs and benefits of several locations nor discuss the possibilities of state aid at other locations. This is also consistent with the aid amount awarded (€13.4 million), which is at the lower range in the total sample of 28 investment projects[304].

7.4 Benefits of the investments

As can be seen in the following table, all projects were implemented as planned and are now completed.

Table 21: Project status and achievements[305]

Beneficiary	Status	Planned				Achieved*			
		Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/job (k€)	Aid (m€)	Invest. volume (m€, nominal)	Jobs	Aid/job (k€)
Papelera	Completed	4.2	64.8	25	170	4.2	64.8	n/a	n/a
SAICA	Completed	12.8	162.0	110	116	12.8	162.0	54**	237
Portucel	Completed	37.9	543.0 (discounted)	180	291	37.9	543.0	n/a	n/a
Celbi	Completed	89.9	319.0 (discounted)	n/a	n/a	89.9	319.0	5**	17,990
Europac	Completed	13.5	74.1	n/a	n/a	13.5	74.1	15**	899

Aid (m€): Total aid amount in million Euro
Invest. volume (m€, nominal): Total nominal eligible investment sum in million Euro
New jobs: number of jobs created
Aid/new job (k€): Total aid amount per job created in thousand Euro
Euro equivalent calculated based on exchange rate on the date of the notification
figures in () indicate a reduction in the number of jobs at the site

[304] The aid intensity amounted to 18% GGE but the total eligible sum of investment (according to section 4.2 "Eligible expenses" of the Guidelines on National Regional Aid for 2007-2013) was relatively modest (€74 million).

[305] European Commission. State Aid Register; Interviews with granting authorities and beneficiaries (*between November 2011 and February 12; **in June 2012)

Both the planned and paid amounts of aid per new employee are by far the highest among the whole sample of 28 investment projects selected for the study. As will be seen, this is partly justified by the fact that the investment involved the introduction of new machinery and production processes to increase the production volumes and competitiveness through higher productivity.

7.4.1 Effects on direct jobs

Gross change in direct jobs

As shown in Table 21 above, most investments generated new jobs. The number of direct jobs created is particularly low compared to the investment amounts and the state aid awarded (the amount of aid paid per new hire is extremely high compared to other cases). In the case of SAICA's investment project, for example, 110 new direct jobs were expected once in operation, but only 54 direct jobs had been created at the time of the interview. Papelera Guipuzcoana achieved the targeted creation of 25 new direct jobs

Compared to employment trends for the sector (see section 7.1 above), the slight increases in the number of jobs at the Spanish and Portuguese production sites appears to have been a positive outcome of the investments. In addition, as mentioned just below, one can reasonably argue that jobs have been safeguarded.

All beneficiaries indicated that more than 80% of the newly hired employees live within a 50 km radius of the investment site. No company brought any expatriates to the region as a result of the investment.

Jobs safeguarded

In the cases of Europac, Celbi and SAICA, the beneficiaries acknowledged that the number of jobs created is low, but they also stated that the investment projects helped safeguard the existing jobs as they improved the productivity and competiveness of existing operations in a restructuring industry. In the case of SAICA, the beneficiary said that the production plant in the Península de Setúbal has become the most profitable in the group as a consequence of the aided investment.

Quality of jobs and training

Due to the introduction of new equipment and processes, most projects also included investments in human resources in terms of training of the labour force. The beneficiaries who responded to this question indicated that they are spending ca. €100,000 annually on training of employees. This is relatively high when compared to other cases in terms of the amount spent per new employee.

7.4.2 Indirect effect on jobs and additional demand in the regions

Indirect effect of the investment phase

During the investment phase, the beneficiaries spent on average ca. 17% of the total investment sums with suppliers within a 50 km radius of the investment sites.

Indirect effect of the operating phase

In all projects, the anticipated creation of a considerable amount of indirect jobs was an important reason for the granting authorities to give aid, and a strong expected impact on the *supplier base* justifies to some extent the relatively high amount of aid per new employee allocated for these projects. At the time of the decision, the sectors in which it was expected that the most indirect jobs would be created were timber and transportation services, i.e. the beneficiaries' suppliers. The creation of about 900 indirect jobs was expected for SAICA, about 75 for Papelera Guipuzcoana and about 1,500 for Celbi.

Table 22: Impacts of investment in operating phase[306]

Beneficiary	Number of direct jobs created	Number of indirect jobs created within 50 km radius	Additional turnover generated by investment (€m)	Percentage of additional turnover spent within 50 km radius of site
SAICA	54	160	185	35.5% - 1.5% Goods/Equipment - 13% Services - 21% other supplies
Celbi	5	500	200	n/a
Europac	15	50	[25-30]	31% - 25% Goods/Equipment - 5% Services - 1% other supplies

The information collected from the interviewees suggests that indirect jobs have indeed been created, yet their number is below the anticipated figures. According to the interviewees, SAICA's investment created about 160 indirect jobs, Europac about 50 and both Celbi and Portucel about 500 within a 50 km radius of the site. Discrepancies between expected and actual achievements could not be explained.

According to the two beneficiaries who responded to this question, some 30% of the additional turnover generated by the investment is spent locally, i.e. within a 50km radius. Moreover, the additional turnover expected from the investment is relatively high when compared to the whole project sample). All beneficiaries stated that they are working exclusively or mostly with the same suppliers as before the investment. Europac pointed out that suppliers are mainly from the waste paper business, which has evolved positively in the last years.

Additionally, two beneficiaries (SAICA and Celbi) pointed out that their investments induced investments on the part of some of their suppliers. For example, a maintenance service centre with 177 employees was established in close proximity to the new SAICA paper mill. Other suppliers invested in trucks and machinery, and built workshops to satisfy the additional demand.

Most beneficiaries serve only a rather small and existing *client base* in the region. The investment had no substantial impact on these relationships.

7.4.3 Other effects

R&D activities and cooperation with higher education institutions

In three projects (Celbi, Portucel, Europac), the beneficiaries put emphasis on their cooperation with national and local higher education institutions for research and development activities. The investment projects strengthened such cooperation.

For instance, the Portuguese companies (Celbi and Portucel) enhanced their R&D activities in cooperation with regional and national science and technology organisations through the intermediary of their research centres. In the case of Celbi, R&D agreements with universities and other research centres were also initiated after the investment. One example of a research topic is genetic research on eucalyptus.

Spill over and clustering effects:

As noted above, in two cases the beneficiaries pointed out that their investments induced investments on the part of some of their suppliers. Celbi noted that suppliers have been able to increase their domestic and international visibility, and have established new contacts with larger customers using Celbi as a reference. In the case of SAICA, the interviewee indicated that with

[306] *Source: Beneficiaries (June 2012)*

the new investment and know-how developed by the suppliers in working with SAICA, the region increased its attractiveness for other companies.

Europac's investment was directly linked to the consolidation of an industry sector, which is increasingly important for the Castilla-León region. Paper exports are growing and now represent a third of sales of industrial goods manufactured in the region. This growth has also encouraged the creation in neighbouring areas of a small paper-recycling cluster (glues and solvents that the company uses in its production process). Its influence on the surrounding industry base is significant through inter-sectoral relationships and external economies of scale.

Follow-on investment:
In one case (Papelera Guipuzcoana), follow-on investments by the beneficiary can be observed. Indeed, the investment project evaluated was part of a strategic investment plan, which involved additional investment phases on the operational site selected.

7.5 Impact on competition and other regions

7.5.1 Impact on competition

This section will analyse the potential impacts that the projects considered in the case study may have on the overall level of competition in their respective markets. To do so, the potential excesses in the market power of each firm as well as the inefficiencies of the market structure itself are screened. The former is assessed by considering the market share of each company, the latter, by assessing the conditions of the market and the potential situation of overcapacity. The considerations are then summarized in order to understand the potential negative effects on the competitors with a particular focus on potential crowding out.

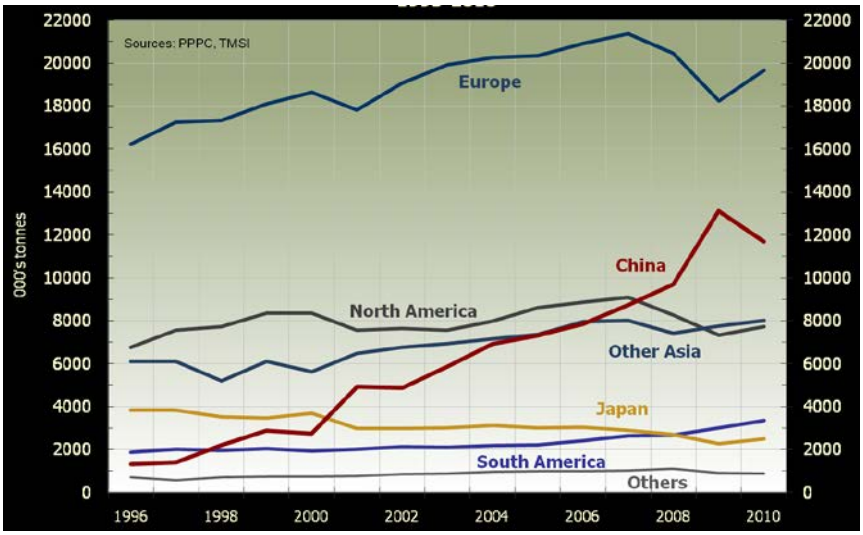
7.5.1.1 Potential distortions due to market inefficiencies

Pulp (Celbi)
In the case of Celbi only, pulp is considered as an output (Papelera Guipuzcoana declared to invest in its pulp productive capacity for internal use, thus defining the final market as paper for this particular case[307]).

Market conditions
The demand for paper grade pulp worldwide has been increasing in the last ten years, albeit showing different trends depending on the regional markets considered. For instance, the EU market has been growing during the period 2000-2007, shrinking during the period 2008-2009, and then growing again. The gap in demand in the EU in 2008-2009 was matched by an increase of demand in China. Overall, trends indicate a growing market, with demand being more sustained for hardwood pulp (produced by Celbi) and steady for softwood pulp.

[307] European Commission. State Aid N 900/2006 – Portugal MSF 2002 - "Individual aid to CELBI, S.A. (available at : http://ec.europa.eu/competition/state_aid/register/ii/doc/N-900-2006-WLWL-en-27.06.2002.pdf)

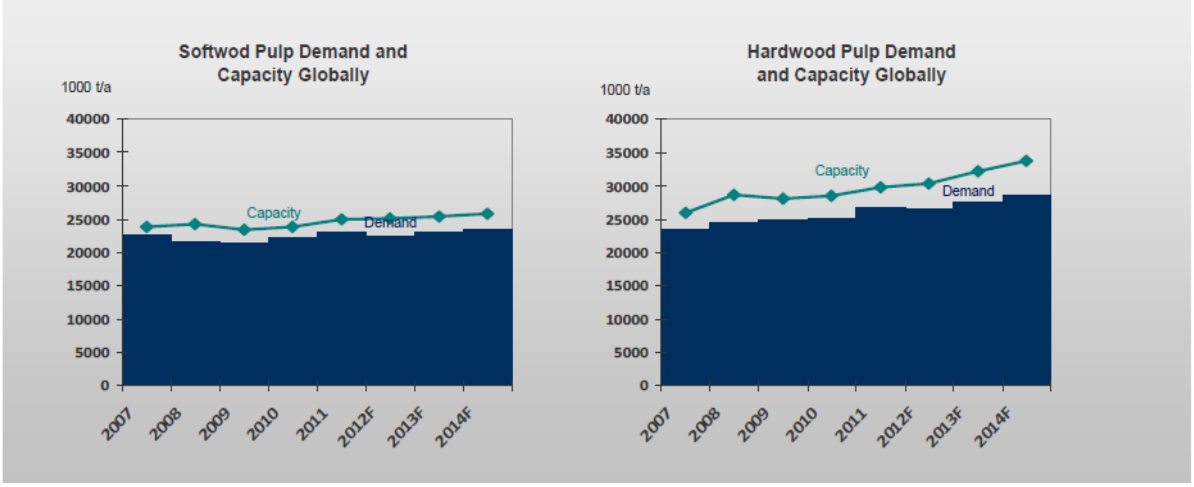
Figure 30: Paper Grade Pulp Market 1995-2010[308]



Overcapacity

The pulp market appears to be in overcapacity, with supply constantly higher than demand for the whole period from 2007 to 2014 according to estimates from the Pulp and Paper Products Council[309]. Oversupply in a global market entails inefficiencies in the market structures even when this demand is growing more than the output in the relevant geographical area[310]. This situation generates concerns about the potentially distortive effect of an aided investment meant to increase productive capacity.

Figure 31: Global pulp demand and supply 2012 Outlook[311]



Paper (Papelera Guipuzcoana, Europac, SAICA, Portucel-About the Future)

Market conditions

The market for paper products is complex. Paper is made either of pulp mechanically treated, so called "wood-containing" (WC), or of pulp chemically treated, also referred to as "wood-free" (WF). In addition, wood-containing and wood-free paper can be either uncoated or coated. In the

[308] McClay (2011). Global trends in market pulp. Based on estimates from the Pulp and Paper Products Council. Available at: http://www.chinaforestpaper.com/exp/en_2/images/report/report/7.pdf

[309] Metsa (2012). Profitable paper and pulp business. Available at: http://www.metsaboard.com/materialarchive/Material%20Archive/Other%20IR%20presentations/2012/CMD-2012-Head-of-Paper-and-Pulp-Seppo-Puotinen.pdf

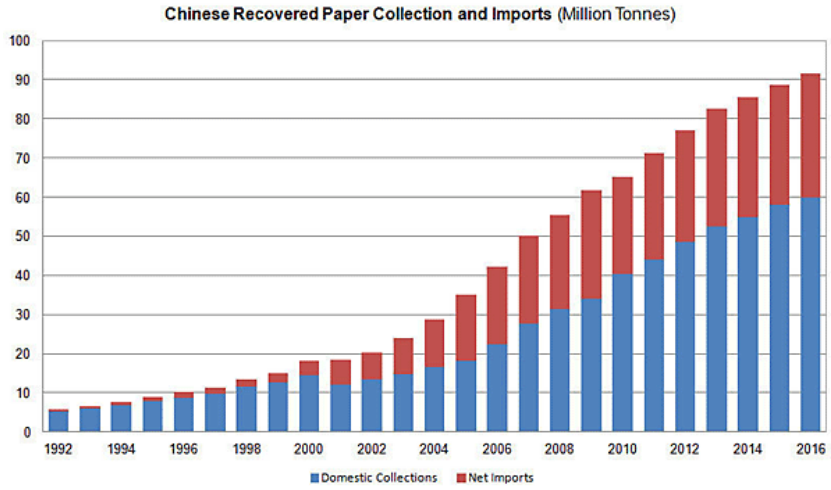
[310] For the Commission criteria in assessing the underperformance of the market, see the introduction.

[311] RISI(2012). 2012 Outlook for Global Recovered Paper Markets. Available at: http://www.risiinfo.com/risi-store/do/product/detail/recovered-paper-study.html?source=PR1205SF

case of coated paper, the paper surface is coated with a coating mixture of clay or chalk and other substances in order to get better results in printing. Given its substantially higher quality/printability, coated paper is more expensive than uncoated paper. Moreover, packaging paper and paperboard markets should be considered. Paper and paperboard are usually referred as a sector and the market considered is usually the global one. When examining the notified aid cases, the Commission decided to follow a two pronged approach: unpacking the possible markets in EEA and world and unpacking the possible products, or considering them possible substitutes. A complete unpacking of all the products and market is too complex for the scope of this case study. In each of the cases, the Commission relied on external consultancies to provide estimates for the market shares and their evolution. Here just some general considerations are highlighted.

Globally, the paper and paper board market is seen to be growing, most notably through increasing demand from China (see figure below[312]). Considering global position, the market is performing well and there is no concern about potential distortion of the aid in this particular respect.

Figure 32: Chinese Recovered Paper Collection and Imports (Million Tonnes)[313]



However, one has to bear in mind that the European market is declining and its relative market share is likely to decrease in the future, as can be seen in the figure below.

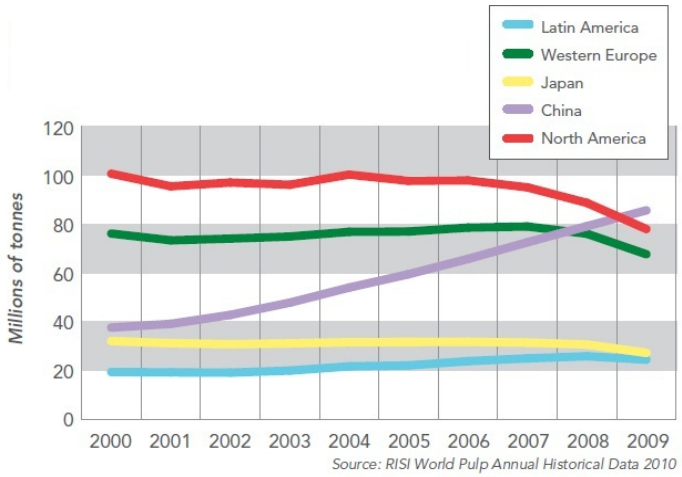
Overcapacity

Moreover, while Europe has been a net exporter of paper products, the growth of foreign markets and exports, especially to Asia, has not been sufficient to match the gap in decreasing demand within the domestic market. As export markets are becoming more important, the European Industry has been facing an increased level of competition with new international players emerging in both the pulp and the paper markets.

[312] RISI(2012). 2012 Outlook for Global Recovered Paper Markets. Available at: http://www.risiinfo.com/risi-store/do/product/detail/recovered-paper-study.html?source=PR1205SF

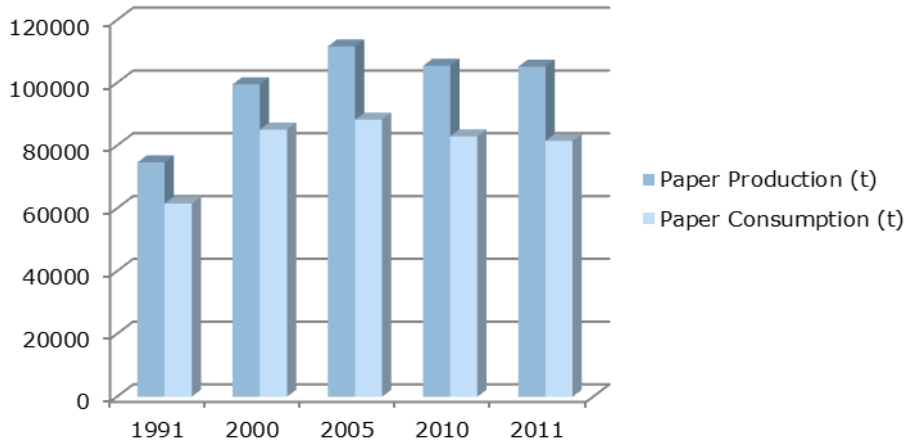
[313] Ibidem;

Figure 33: World paper paperboard consumption per main market[314]



Hence, productive capacity, albeit growing on the long run, is under pressure due to persistent overcapacity issues in the European industry on the one hand (as it is shown in the graph below) and the need to increase productivity through economies of scale and innovation on the other hand (as illustrated by the analysed investment projects).

Figure 34 : Production and Consumption of paper in Europe[315]



Within this context the market has been undergoing a process of restructuring with declining capacity in Europe resulting from this overall reshaping of the production process. Although efficiency seeking through increasing capacity (SAICA, Europac) and verticalization (Papelera Guipuzcoana and Portucel) can be justified on the grounds of the restructuring the market, overcapacity also raises concerns about the wider impact of state aid supported investment.

[314] RISI (2010). World Pulp Annual Historical Data 2010.

[315] Chart based on data retrieved from CEPI (2011). European Pulp and Paper Industry. Key statistics 2011. Available at: http://www.cepi.org/topics/statistics

7.5.1.2 Potential distortion due to excessive market power

Pulp (Celbi)

The five major producers of bleached eucalyptus craft market pulp in the world (*i.e.*, Aracruz, CENIBRA, Portucel S.A., Suzano Papel e Celulose S.A, and VCP) accounted for 54% of the total world production capacity of Pulp in 2009. In 2005 this share was of 57%, with no change in the top companies. The market is then loosing concentration, most probably as a result of the growth of Chinese production. Competition is said to be very high, especially due to the presence of competitors able to act in every major market and to compete on both quality and price[316]. Celbi is not ranked amongst the top five global manufacturers, with post investment position equating to no more than seven percent of the global market. Consequently, whist the investment is rather high in absolute terms is unlikely to have impacted upon market concentration.

Paper (Papelera Guipuzcoana, Europac, SAICA, Portucel-About the Future)

Market concentration in the paper-making subsector is as follows: the CR10 index (share of the market controlled by the top ten companies) is high (> 85%) for coated mechanical paper, uncoated mechanical paper, newsprint and coated wood free paper; medium (65% to 85%) for cardboard, market pulp, and tissue paper; low (< 65%) for uncoated wood, free, container board and wrapping papers[317].

Of the four companies with an investment project is relevant to the paper market, Portucel is the only one with a significant market share: 15% on the European market for WFU and ranking as sixth largest producer in the world in 2011[318]. In this context, it should also be noted that with a total eligible investment amounting to €543 million and a state aid amounting to more than €52 million, Portucel's investment is one of the largest of the sample for the paper and pulp industry, and one of the largest among the whole sample of 28 investment projects, adding some concerns about potential market distortion in this particular case. However, given that the company's market share remains significantly below the threshold of 25% set out by the Commission to characterize dominant market position, it is not possible to conclude that in this case there was any market distortion through market power.

Although information is lacking about their market share, the other beneficiaries do not appear to have significant market share within the paper sector and consequently no explicit concerns about the effect of the aided investment on their market position have been raised as a result of this study.

7.5.1.3 Effects of aid for competitors

The central source of concern relating to the potential impact of state aid on competition is links to market inefficiencies within the pulp and to a greater extent the paper industry. During a period of restructuring investment can be justified by the need to improve efficiency in part through the generation of economies of scale generated as production capacity is increased.. However, the period covered by this study analysis is characterised by overcapacity and a continuing reduction in production capacity in Europe.

A level of scepticism was expressed by stakeholders from competitors companies as to whether it is appropriate to subsidise a sector that is restructuring, with mills being closed across Europe[319]. Two competitors expressed themselves to be opposed to subsidies in the pulp and paper industry in Europe, as they *potentially* have a negative impact on price and profitability. Seen from the Nordic pulp and paper industry, it can be easily understood that the state aid awarded to investments was viewed to have had a distortive effect, as it helped to facilitate the maintenance or even an increase in production capacities in south-western Europe, where production plants

[316] Aracruz Cellulose S.A. 20-F 2009. Available at: http://www.wikinvest.com/stock/Aracruz_Celulose_S.A._%28ARA%29/Filing/20-F/2009/F2077032

[317] DG ENTR: Forestry Industry. Available at: http://ec.europa.eu/enterprise/sectors/wood-paper-printing/paper/competitiveness/index_en.htm

[318] Portucel Press Release (2012). Available at: http://backoffice.portucelsoporcel.net/dynamic-media/files/20110217prportucelsoporcelgroupshareofeuropeanpaperexports_.pdf

[319] All of them are Scandinavian companies, which bring an interesting perspective for the analysis since these are part of one of the European paper and pulp industry clusters.

were often operating with outdated technologies[320] and low productivity. Such an assertion is also consistent with the fact that collected evidence tends to indicate that the aid did have a leading incentive effect for the case studies in this industry.

Whether the aided investment had actual negative impact in terms of crowding out is more difficult to assess, as clear evidence is lacking. However, two competitors expressed concerns about the impact of the aided investments on their company. They stated that they believed the aided investment increased price pressure by adding capacity to the market. The investment by Celbi, which received the highest level of aid of any project in the sample in both absolute and relative terms, seemed to be most problematic as it was explicitly mentioned by more than one interviewee. However, only one competitor mentioned that its sales and profitability were substantially affected as a result, where it led to a decrease in the level of the company's employment and production. According to the interviewee, its competitor's aided investment can be held partially responsible for the closure of one paper mill in France, resulting in total job losses of 350 employees.

7.5.2 Impact on other regions

No systematic evidence of the impact of the aided investment on other regions could be collected in this particular case study. However, interviews with competitors have shown that aided investments in Spain and Portugal had potentially a negative impact on the pulp and paper industry in other European regions where pulp and paper is produced, e.g. in Scandinavia and Finland. The only example mentioned by the competitors, however, concerned the closure of a paper mill in France, where the pulp and paper industry had been significantly impacted upon by restructuring[321]. That said the link between the aided investments and the example mentioned could not be established.

7.6 Conclusion

The following section sets out the conclusions relating to the Pulp and Paper Industry in Spain and Portugal:

Determinants of investment or location decisions of the aided firms
Beneficiaries looked to invest because they needed larger and modern facilities in order to remain competitive, while also seeking to increase market share. Whilst the availability of aid did not appear to be the primary investment driver, the majority of beneficiaries agreed that regional aid was instrumental in facilitating access to finance. It also influenced the timing and size of the investments.

A majority of beneficiaries did not consider alternative locations and planned modernisation of existing production sites, which already offered good transport infrastructure, good availability of raw material and a skilled labour. In two cases, alternative locations for the investment were said to have been considered, but evidence does not suggest that this was a fully considered process. In this particular case study, the companies are bound by strong connections to the regional industrial base, and evidence indicates that state aid did not influence the beneficiaries' location decision.

Consequences of the investments in terms of regional and employment benefits and externalities
The investment projects have generally been beneficial for the regions in terms of the creation of direct and indirect jobs. Whilst the total number of direct jobs created has been low, the beneficiaries emphasised the importance of jobs safeguarded through the extension and modernisation of existing operations. With regard to the number of indirect jobs created, the beneficiaries underlined the high impacts, although there were only a few cases where evidence

[320] Control Engineering Europe (2012). "Pulp and paper production increased". Available at: http://www.controlengeurope.com/case-studies/173/Pulp-and-Paper/ ; and Green Press Initiative (2007). "The state of the paper industry". Available at: http://www.greenpressinitiative.org/documents/StateOfPaperInd.pdf

[321] De Ferrière le Vayer, M. (2006). "Did the progressive absorption of the French paper industry create European firms?". CEHVI, Univesité François Rabelais, Tours. Available at: http://www.helsinki.fi/iehc2006/papers1/Ferriere.pdf

could be collected to verify the assumed impacts. Other effects, such as investments in R&D and spill over, were apparent in a few cases.

By supporting investment in extensions of facilities and changes in production processes, regional aid did not seek to use aid to govern location decisions, but it was focused on retaining and improving production capacities and with them, local jobs. In an industry marked by high job losses, the aided investments had a highly positive impact: most beneficiaries increased and maintained jobs at the production sites. According to beneficiaries, part of these outcomes can be attributed to the regional aid. In fact, the positive influence of the aid was not necessarily on the investment decision as such, but on the capacity of the firm to finance large investment through bank credit, and to achieve a critical mass from the investment enough to benefit from patent productivity gains. Hence, seen from the granting authorities' perspective, the regional aid can be said to have been efficient.

The distortive effects of aid for competitors and/or other regions

Seen from an EU perspective, the picture is less clear. The pulp and paper industry has been subject to significant levels of restructuring over recent years, marked by overcapacity and job destructions. In this context, it appears that investment aid contributed to maintain inefficient market structures and gave a competitive advantage to the beneficiaries who were able to protect their employment levels and market position. Some of the competitors interviewed expressed concerns about the impact of the aided investment on their businesses.

8. GENERAL FINDINGS

This chapter builds on an analysis of the findings across case studies and sets out answers to each of the evaluation questions set out in the introduction to this report.

8.1 Decision-making processes within the granting authorities and investing firms

Analysing the decision-making processes of the granting authorities and the investing firms appeared to be an important element to better understand the influence regional aid might have had. This was not only to identify potential correlations between the aid intensity and the influence of the aid, but also between the aid intensity and the regional externalities. The main findings regarding the decision-making processes taking place between the granting authorities and investing firms are described below.

8.1.1 Decision-making process in granting authorities

In what follows, the main characteristics of the granting authorities' decision-making processes are analysed and the consequences for the analysis are explained.

8.1.1.1 Aid scheme(s) and granting authorities

Granting authorities offer a variety of aid schemes that differ in terms of the type of eligible expenditure (i.e. capital expenditure vs. labour costs) and the types of instruments that are used (i.e. direct grant, tax relief, soft loan etc.).

Regional aid schemes are designed in accordance with national regional development strategies. As part of the latter, priority sectors, types of projects and regions are identified. These are generally taken into consideration in the project evaluation and, in some instances, in the setting of the level of aid awarded (e.g. in Ireland and Poland).

Furthermore, granting authorities differ as to what level of government administration may decide to grant regional aid. In two case studies a regional granting authority awarded the aid. These were the solar industry in Germany and the pulp and paper industry in Spain.

From the evidence collected, it appears that the level at which the decision is made potentially influences aid intensity. Regions which are competing to attract an investment within the same country may end up in a "subsidy race". This tendency can be illustrated by comparing the pharmaceutical industry in Ireland and the solar industry in Germany. These two case studies are similar in many aspects: both deal with high-R&D-intensive investments located in a regional or inter-regional industrial cluster offering a qualified labour force, ancillary industries, R&D and training institutions and infrastructures etc. and investors considered alternative investment locations both within the same country and worldwide. However, while in Ireland the aid intensity offered was significantly lower than the maximum permitted level, in Germany it systematically reaches the authorised ceiling. This is discussed further in section 8.2.

8.1.1.2 Project evaluation

The ex-ante project evaluation processes and criteria applied differ to a large extent from one granting authority to the other.

In most countries, projects are assessed against a set of qualitative criteria that reflect both the policy priorities of the public authorities (in terms of regions, sectors and types of activity, for instance) and the potential benefits of the projects (in terms of the number and the quality of jobs created, the complexity of the processes to be performed or the technologies to be used, the level of involvement in cooperation with local universities, the level of R&D expenditure etc.). Hence, the potential impacts of the investment projects are taken into consideration in the decision to award state aid under the RAG. When it comes to assessing the impact of the aid on the development of the regions, this induces a problem of *reverse causality*[322].

Within this study there was no evidence of cases where the incentive effects of aid on the investment or location decisions were carefully assessed as part of the ex-ante project evaluation carried out by the granting authorities. The obligation for the investors to prove that regional aid was necessary for their investments appeared to be dealt with as a formality. The Polish granting authority, for instance, asks applicants whether alternative locations are being considered for their investment. To comply with this information obligation, investors can simply indicate an alternative location in their application without that information being subject to verification.

8.1.1.3 Level of state aid

Practices in determining the amount of aid allocated to investments also differed significantly from one granting authority to another.

Ex-ante project evaluation and the setting of the appropriate level of regional aid are simultaneous processes. The most structured approach can be found in Poland, where different evaluation criteria were applied within the framework of a multi criteria analysis. Each investment project was assessed against a set of weighted criteria and the final mark obtained by the project determined the exact amount of aid allocated per job created. In the internal business services case study, this resulted in aid intensities that are not only among the lowest across the case studies in the sample, but also significantly lower than the maximum permitted level. According to the Polish granting authority, the aid amount was not negotiable. This is a unique case in the sample analysed.

In Ireland, the granting authority used a cost-benefit model to assist in project evaluation and the setting of the aid amount (the benefits of the investment should always exceed its costs, including the aid amount). The Slovak granting authority also conducted financial and socio-economic analysis to evaluate investment projects. The regional granting authorities in Germany, on the other hand, did not use any economic cost-benefit modelling process, deeming it to be an inefficient tool that created more administrative burden than it is worth and helping little in making informed decisions.

With the exception of the Polish granting authority, all other granting authorities “negotiated” the level of financial incentives with the potential beneficiaries, suggesting that the outcome of such negotiation (subject to the ceiling set by the RAG was at least in part dependant on the relative bargaining power of the two parties involved.

The bargaining power of the beneficiary was strengthened if the value offered by the investment to the regional economy was high; it was also strengthened if there was a high probability that in the absence of state aid investment would move to another country. This indicates that aid intensity does not necessarily determine the effect of the aid on the principle investment decision; on the contrary, it is more likely to indicate that the incentive effect of the aid (i.e. the

[322] Reversed causality arises when assessing the impact of aid: granting authorities strive to maximize the return they get out of the aid they pay, so they tend to award higher aid amounts to investment projects that offer higher impact (this is also called “selection bias”). Reversed causality also arises when assessing the location decision of firms: firms choose a location according to the return they get there, which is directly linked to the locations factors (including aid). This issue, well know by econometricians as “endogeneity”, makes the analysis of causality very challenging.

probability that the investment would locate elsewhere without any aid) determined the level of regional aid. This "*reverse causality*" should be taken into account when assessing the impact of the regional aid on the investment or location decisions. As has been demonstrated, the case studies that had the lowest aid intensities are also those that appeared to show the lowest overall incentive effect.

The table below indicates the average aid intensity for each industry case study. As can be seen, the level of aid varies significantly from one case study to another, as does the extent to which awarded aid reaching the maximum permitted level set by the RAG.

Table 23: Average (arithmetic) aid intensities for each industry case study

Sector	Country	Max GGE / NGE permitted at regional level	Max GGE / NGE permitted in specific cases	GGE granted	Granted / Max
Cement industry	Hungary	50.0%	29.3%	15.0%	51%
Car industry	Slovakia, Hungary	36.7%	17.2%	14.5%	84%
Solar industry	Germany	30.0%	13.9%	13.7%	99%
Paper / pulp industry	Spain, Portugal	25.8%	14.5%	11.3%	78%
Internal business services	Poland	42.9%	42.9%	4.4%	10%
Pharmaceutical	Ireland	12.9%	7.9%	4.1%	52%

GGE: Gross Grant Equivalent; NGE: Net Grant Equivalent

8.1.1.4 Terms of the aid agreements

Aid agreements between granting authorities and beneficiaries also differed from one case study to another.

In Ireland, Poland and Slovakia, the payment of aid was conditional upon the achievement of objectives in terms of the number of jobs created. These rules are strictly applied by the Irish granting authority, which refused to renegotiate the aid agreement if the objectives were only partly achieved. In the Polish case study, there was at least one investment project in which aid agreements were renegotiated.

In other case studies, one can find examples of projects where aid was paid in full even though the objectives were not fully achieved. Examples include investment projects in the pulp and paper industry in Spain and Portugal and in the solar industry in Germany.

8.1.2 Decision-making process within investing firms

Investment decisions involved a series of complex processes, which are described below.

8.1.2.1 Investment decisions

In the case of all the investment projects that were analysed, the Board of the aided firm was involved in the final investment decision and the decision process was most frequently handled at the highest level within the particular organisation. This in part helps to explain the difficulty in accessing information regarding investment and location decisions.

In the investment decisions, one can distinguish top-down and bottom-up processes. In the top-down process, the investment project is initiated by the parent company. This was the case, for instance for the internal business services case study in Poland, where the businesses' sourcing decisions were always initiated from the top.

By comparison bottom-up processes tended to originate with decentralised business units that proposed an investment project to their parent company. In such cases, the local management sought to reinforce the position of its business unit not only externally on its markets, but also internally against other business units of the firm. Such examples were found in the pharmaceutical sector in Ireland, where production locations compete with each other and where

local management could propose investment projects to the board of their parent company. In such cases, the decision is both a decision to invest and a decision to invest in a specific site at a given location. Indeed, the investment and location decision can sometimes be difficult to separate. This was particularly true for those cases in which the investment was carried out at an existing site.

Investment projects at existing research and production sites may also be allocated on the basis of an internal competitive call. This can arise when firms decide where to develop or manufacture new products. In such cases, the decision process includes both top-down and bottom-up components. Examples of this can be found in the pharmaceutical industry in Ireland.

As will be seen in section 8.2, the incentive effect of regional aid on the investment decision is less marked than the incentive effect on the location decision. This might well be due to the fact that the investment decision is made before the location decision and involves highly strategic considerations on the part of the firm. Once the decision to invest is taken, aid can only influence the size of the investment. Moreover, if this decision is not made for a specific site only, the search for the best location begins and all relevant possibilities are compared. This is where granting authorities may play a role by providing certain incentives.

The investment decision involves a financial assessment of the project, including sensitivity and risk analysis. However, in no instance, did the interviewees indicate that they had examined an "invest/don't invest" decision solely on the basis of those calculations or on the basis of whether aid was going to be allocated or not. Instead, it appears that aid principally impacts on the scale or the timing of a project.

8.1.2.2 Location decisions

Location decisions are characterised by the multiplicity of selection criteria considered by decision-makers. As is the case with the investment decision, the location decision usually involves the board of the investing company. However, it also appears that the location decision is more decentralised than the decision to invest itself, as it may require local expertise to complement the strategic foresight of a company's board. In the case of new investments (so-called "greenfield investments"), a project team is often set up and made responsible for supporting the board in the location decision. In addition, external consultants are usually involved in the screening of possible locations. Such practices were observed in the cases of internal business services in Poland, the solar industry in Germany and the car industry in Slovakia and Hungary.

In order to ensure efficiency of the investment, hard location factors are assessed in monetary terms, including costs of land, labour, commodities and transport. However, in none of the analysed projects did it specifically appear to be the case that return on investment calculations were used to compare alternative locations. More usually, a multi-criteria analysis was applied at the location decision stage.

Different sequences can be identified for the location decisions. A first model involves distinguishing between hard and soft location factors: First, different locations are shortlisted on the basis of hard location factors (if necessary, an anonymous information request – usually through a consultant – can be sent to the granting and or local authorities). Only then are contacts to granting authorities and/or local authorities formally established by investors. During the dialogue that follows, the granting authority can try to influence the location decision. Such was the situation with the solar industry case study in Germany.

A second model consists in distinguishing between different geographic scales: in each step, the size of the potential location is reduced. In the case of the internal business service in Poland and the car industry in Slovakia and Hungary, the first step was to decide to invest in Central and Eastern Europe (for low labour costs within the EU); the second step was to identify the country of investment, and the third was to identify the specific location (e.g. region or city). The second step was on occasion skipped for instance where several cities from different CEE countries were compared.

8.2 The determinants of investment or location decisions of the aided firms

This section provides answers to the following questions set in the terms of reference of the study:

1) Identify the determinants of investment or location decisions of the firm in question
- a) What were the main factors taken into account by the firm in its decision to invest in the project and to select the location of the investment?
- b) What was the relative weight of these factors and in particular of the regional aid in this regard? Was the aid pivotal?
- c) What would the firm have done without aid?
- d) Which were the alternative locations if any? Advantages and disadvantages of those locations

8.2.1 Determinants of investment decisions

8.2.1.1 Determinants of investment other than regional aid

The main determinants of investment decisions other than regional aid can be divided into three broad categories:

Need to increase efficiency (efficiency seeking)

The most commonly shared investment objective is *efficiency seeking*. In some projects, the need to increase efficiency through cost reduction, economies of scale and/or higher productivity is the main investment driver, and was evident to a greater or lesser extent in all projects considered in this study.

The most striking examples of investment projects driven primarily by a desire to see efficiency gains can be found in the internal business services case study in Poland. Most investment projects consisted of replacing hitherto domestically supplied service functions by imported services produced in Central and Eastern European countries by specialised business units. Efficiency gains were expected from higher specialisation through geographic concentration of support functions and lower labour costs. In such cases, the investment and location decisions go hand in hand, because the projects consist of the relocation of existing activities to low-cost locations.

Another example is the pulp and paper industry in Spain, where investment projects were also driven by the need to increase productivity, linked in these countries to the need to remain competitive.

Efficiency-seeking projects occur in competitive markets. However, competition can also occur between different production sites of the same company. This was apparent in the pharmaceutical sector in Ireland with for example, the investment project of SmithKline Beecham in Carrigaline.

Need to meet a growing or changing demand (market seeking)

A second category of investment determinants can be grouped under the generic concept of *market seeking*. In such cases the investment decision is determined by the need to meet increasing or changing patterns of demand.

The cement industry in Hungary provides examples of investment projects that were driven by *growing demand*: at the time of the investment decisions themselves. Another example is the solar industry in Germany, where the market growth, heavily supported by government policies in favour of renewable energies, was an important investment driver. Better access and proximity to growing markets is another important factor driving investment decisions: case studies in both Germany and Hungary revealed that investment and location decisions were highly interrelated in this respect. In the case study of the pharmaceutical industry in Ireland, investment projects

were also driven by growing demand. However, the production sites of pharmaceutical companies are part of a global production chain and market and in this case, geographical proximity to growing markets did not play a role in the investment or location decision.

Market seeking is not only related to growing demand, but also *changing demand* as well as *technological innovation* (see below). Both induce the development of new products, which in turn requires investment in new production processes and new or additional production lines. This has been observed in the case of the car industry in Slovakia and Hungary, where investments addressed growing demand for smaller cars. In the case of the pharmaceutical industry in Ireland there are similar examples: Investment projects were driven by the need to prepare for the production of new products entering the clinical trial phase before receiving the licence to be produced and marketed to the public.

Need to access new technologies (resources seeking)

A last category concerns those investments aimed at increasing or improving factors of production, i.e. investments driven by *resource seeking*. In most case studies, the availability of raw materials (e.g. cement industry in Hungary) and skilled human resources (e.g. internal business services in Poland) were important determinants of the choice of location. In a set of investment projects, however, the *availability of new technologies* was an important determinant of the investment decision.

In the case study on the pulp and paper industry in Spain and Portugal, the availability of new production technologies provided companies with strong incentives to modernise their production machinery. In this case study, resource seeking was strongly connected to efficiency seeking. In the pharmaceutical industry in Ireland, fast developing technologies and opportunities led companies to increase their capacities in the manufacturing of biopharmaceutical products. The need to access biotechnologies (including a highly qualified labour force, R&D capacities and specialised suppliers) and hence to benefit from the market and development potential offered, was a key investment driver.

8.2.1.2 Incentive effect of regional aid in the initial investment decision

Decisions to invest are highly strategic for the aided firms and the study findings suggest that regional aid had at most a marginal impact on the initial decision for a company to initiate an investment programme.

Financial calculations are carried out by firms to help estimate the rates of return of their investment and levels of potential aid are generally taken into account in such calculations. Aid was never reported to be irrelevant, but no investor consulted during this study considered such aid to have been a decisive factor in their decision making process.

Study findings suggest that in all projects investment would have been carried out in the absence of state aid. In a few projects, however, interviewees mentioned that aid provided an incentive in terms of the size of the project: these cases include three projects from the pulp and paper industry in Spain and Portugal for which interviewees acknowledged that the aid had had an impact on the size and timing of the initial investment. In addition, the availability of aid facilitated access to financial resources. These projects were mainly driven by efficiency gains, and aid made it possible to increase the initial investment in the short term and expected productivity gains in the medium term. Other projects where the aid was said to be a sensitive factor in the investment decision were Getrag Ford Transmissions in the car industry in Slovakia and Teva in the pharmaceutical industry in Ireland. All these projects, except the Teva investment project (which received an aid amount close to the maximum permitted level) were granted regional aid at the highest intensity level.

Finally, it is interesting to note that no evidence of lock-in effects of state aid on the investments could be observed. In the pharmaceutical industry case study, almost all investors changed their plans before, during or after the investment phase of the projects. The loss of the aid – under the rules of the Industrial Development Agency – did not provide sufficient incentive for companies to maintain the plans as initially agreed upon in the original aid agreement. There is another similar example in the internal business service case study in Poland, where MAN had to reschedule its

investment due to the general economic slowdown in 2008 a consequence of which was the loss of part of the original aid.

8.2.2 Determinants of location decisions

8.2.2.1 Determinants of location other than regional aid

As mentioned above, there are various determinants driving the location decision. This section presents the most important factors in the location decision. The incentive effect of the aid on investment decisions are analysed separately.

Pre-existing operations

One of the most frequently mentioned determinants of location choice is the fact that a company already had a production site at the selected location. Indeed, the sample of projects includes only eleven "greenfield" investments, seven of which related to the setting up of internal business service centres in Poland. All other projects involved the extension of capacities, diversification of output or changes in the production process of existing facilities.

However, this does not necessarily mean that alternative locations were not considered for such projects. One possibility is that existing production sites are competing with other production sites within the same company (e.g. in the case of the pharmaceutical industry in Ireland or the pulp and paper industry in Spain). In such cases the range of possible locations is limited, and also often includes locations outside Europe. Yet, the final decision is based on location factors other than the pre-existence of a site. Another possibility is that existing sites may also be competing against "greenfield" investments at any other location (e.g. in the case of the pharmaceutical industry in Ireland or the solar industry in Germany). However, in these cases the existing sites have a strong competitive advantage. These include, for example, lower investment risks, the possibility of benefiting from internal returns in terms of scale, established relationships with suppliers, and a readily available labour force.

The cases of the pharmaceutical industry in Ireland, the solar industry in Germany and the pulp and paper industry in Spain and Portugal exhibit strong path dependence on the location of investment. In the case of the pharmaceutical industry in Ireland, investment decisions are determined by 40 years of development of the chemical and pharmaceutical sector, which eventually led to creation of a world-class cluster. This partly explains why it is difficult to attract investments to locations with lower industrial density. Furthermore, initially, water supply, a favourable business environment (taxation and patent law), public investment in transport infrastructure and good connections with the US, low-cost and well educated labour force were reasons why pharmaceutical firms established in Ireland. These location factors still hold. Additionally, the public and private sector have continuously invested in education, research and innovation over the past years. Investment projects can be seen as both the cause and consequence of spillover effects.

The same phenomenon of path dependency can be observed in the pulp and paper industry in Spain and Portugal, where initial investments were driven by the availability of raw material (wood) as a production input. The raw material is still available, but with the passage of time the production sites have additionally acquired strong expertise in producing pulp and paper, suppliers have specialised and public authorities have invested in transport infrastructure. Given this context, it is understandable that most interviewees declared that no alternative location was considered. This is consistent with the fact that in the paper industry case study, regional aid provided some (although a limited and not decisive) incentive to invest and modernise in existing production facilities, but no incentive at all to the location decision.

Availability and cost of human capital

A location factor identified by a significant majority of stakeholders was the availability and the cost of the labour force.

Quality of labour force

In almost all cases, the availability of skilled labour was a decisive location factor. The type and degree of expertise sought differed, however, from case to case.

The availability of a labour force with a high level of expertise was an important location determinant in the case studies of the pharmaceutical industry in Ireland and the solar industry in Germany. Both cases involved an industrial cluster and the location choice aimed to take advantage of localisation economies (intra-sectoral externalities). One of those advantages was the availability of a labour force with a high level of expertise. In the case study of the pharmaceutical industry in Ireland, the need for such a high level of expertise relates to the complexity of the technologies (e.g. biotechnologies). In both the pharmaceutical and solar industry case studies, the need for a high level of expertise also relates to the fact that investment projects included important R&D components. For instance, two of three solar industry investment projects in Germany included the setting up of a R&D centre. Therefore, proximity to research, development and higher education institutions, with whom to develop partnerships, was also an important location factor.

The specific expertise of the labour force was also a location determinant in the case of the pulp and paper industry in Spain and Portugal, where the know-how of the local labour force was a reason to invest in the respective regions (and in most cases, in existing plants). In the case study of internal business services in Poland, higher education institutions have developed some expertise in accounting and finance, and are able to provide firms with skilled labour in sufficient number. In a few cities (e.g. Krakow and Poznan), a local cluster in business services also developed. This benefits employers in terms of the quality of available labour force. The language skills of the young Polish graduates were also a factor taken into account in the location decision.

Cost of labour force

The cost of the labour force was an important location factor in most projects analysed as well. With the internal business services in Poland and in the car industry in Slovakia and Hungary, the cost of labour was a decisive location factor, which explains why the projects were located in Central and Eastern Europe. Interestingly, both cases included instances of investment projects that located in areas where the labour force was less qualified due to the absence of industries from the same sector in the regions (e.g. Getrag Ford, Slovakia, or UniCredit in Szczecin, Poland). In these cases, the investors were willing to bear the costs of the absence of agglomeration economies (intra- and inter-sectoral externalities) - such as higher training costs - in order to benefit from the lower labour costs in the relevant regions, which were mainly due to lower industrial density and higher unemployment. In those cases, the regional aid was not used to compensate for the cost of locating in less developed regions, but added to the benefits of doing so.

Quantity of labour force

In the two case studies mentioned above, the cost of the labour force was linked to the quantitative availability of the labour force, since a higher availability of labour induces lower salaries. In addition, most projects analysed entailed a significant number of new hires and the project timing often required high quantitative availability of labour. This explains why, in Poland, an increasing concentration of business service centres in some cities has become a handicap in attracting new investments.

Infrastructure

Transport and accessibility, energy supply and communication networks seem to be considered assumed prerequisites as they were hardly mentioned as decisive factors in the location decisions. It can be argued that the reasons for this are low transport costs (thanks to the good quality of infrastructure in Europe and the use of ICT overall) and the fact that energy costs are to a high extent exogenous to location decisions within Europe.

Still, most cases indicate that infrastructure was taken into account in the location decisions. For instance, good IT infrastructure mattered for internal business services in Poland; road infrastructure appeared to be a determinant in the car industry in Slovakia and Hungary; accessibility to ports was mentioned as decisive in the pulp and paper industry in Spain and Portugal, and the capacity and quality of energy infrastructure were mentioned in the pharmaceutical projects in Ireland. Good flight connections to the country of company headquarters were mentioned in a number of cases. These examples indicate that infrastructure

was a location determinant, but its degree of importance and the type of infrastructure depends to a high extent on the specificities of each sector.

Availability of production inputs

Proximity to raw materials was a decisive location factor in two cases, mainly to reduce the high transportation costs of heavy materials. In the case study of the cement industry in Hungary, new cement plants were established near limestone quarries (which, combined with proximity to market, constituted the main location factor). In the case study of the paper industry, existing production sites were located in afforested areas; this was an additional reason to invest in existing production facilities. In both case studies, the productive capital is rather immobile. Thus, no alternative investment regions were examined. As a conclusion, therefore, aid had no incentive effect for these investment projects.

The cost of commodities was mentioned as a determinant location factor in only one investment project (Getrag Ford Transmissions) from the car industry in Slovakia. Water supply and transport and energy infrastructures were reasons for the pharmaceutical firms to invest in Ireland since the late 1970s.

Availability/cost of land and office space

The availability of land was an important location determinant in establishing new production plants in the solar industry in Germany (in which follow-on investments were already planned at the time of making the investment decision), the car industry in Slovakia and Hungary, and in some instances in the pharmaceutical industry in Ireland. In those cases, the size of the available pieces of land was more important than the land price. In the pharmaceutical industry in Ireland, for instance, Dublin was mentioned as the preferred investment location in a few projects, but an alternative region was chosen due to the lack of availability of land in the Dublin region. In a similar manner to that observed in relation to the cost of labour in Poland, the availability of aid in regions other than Dublin did not really compensate for the cost of locating in less developed regions.

Only in the case of internal business services in Poland was the availability of office space mentioned as decisive. Business service centres established in cities in order to benefit from urbanisation economies (concentration of a young labour force in cities, presence of suppliers in the IT sectors, etc.), and the availability and cost of offices can be critical. The concentration of business service centres in some cities has in fact become a handicap in attracting new investments.

Soft location factors

Political and economic stability played a role in the location decision, but only when locations considered as alternatives were outside Europe. This was the case with internal business services in Poland, where alternative locations included northern Africa or India; this was also the case for the projects in the solar industry in Germany, where China was an alternative location.

Business friendly environments, in terms of taxation or industrial property law, for instance, were also mentioned as determinant location factors in the cases of the pharmaceutical industry in Ireland and the internal business services in Poland.

Finally, support from local authorities in finding the appropriate location was mentioned as a key location determinant. The eagerness and proactivity of the local authorities and other partners locally, such as universities, can make a difference in the final decision. This is also described in the following section.

Agglomeration economies and clusters

Pre-existing operations (e.g. path dependency on previous investments), the availability and cost of human capital (incl. the overall quality and specific skills of the labour force) and the quality of the infrastructure (i.e. transport and accessibility, energy supply and communication networks) induce economies of scale, i.e. internal and external agglomeration economies that benefit to companies in terms of higher investment returns. Such factors explain agglomeration forces and the high concentration of industries in core areas.

Intra-sectoral agglomeration economies (in the form of the presence of an industry cluster) proved to be a significant location factor in the case of the pharmaceutical industry in Ireland, the solar industry in Germany and the paper and pulp industry in Spain and Portugal.

8.2.2.2 Incentive effect of regional aid in the location decisions

This section discusses the effect of regional aid in the choice of location for the firms' investment.

Cases where the aid provided some incentive to locate in less developed regions

The project sample includes projects in which, without regional aid, the investments would have probably been located elsewhere.

The car industry in Slovakia and Hungary is one case study where regional aid provided an incentive for the firms to locate their investments in less developed regions. Labour costs were the main location determinants in the investment projects analysed. For this reason, firms decided to locate their investments not only in Central and Eastern Europe, but in the least developed regions of this area, where high unemployment rates induce low salaries. As such, the cheap labour force already provided a strong incentive to locate the investments in the regions selected rather than in more developed regions, such as Central Transdanubia in Hungary where car industries are concentrated. Meanwhile, beneficiaries were also clear that they expected aid in those countries and regions. One argument put forward was that the locations selected presented some risks (e.g. with regard to the quality of the labour force) and potentially induced additional costs (e.g. training costs). Hence, the aid compensated for the costs to locate in the least developed regions and, in this respect, supported the decision to locate in these regions. In two of three projects analysed in the car industry in Slovakia and Hungary, the amount of aid was close to the maximum permitted level.

The case study of the solar industry in Germany also provides instances where regional aid was a decisive location factor. A skilled labour force and more generally the presence of a solar industry cluster in Germany were among the main reasons for locating the investments in Germany. However, several alternative locations within and outside Europe (China, USA) were considered for each investment project. In the final decision, the amount of regional aid was a strong determinant. Unlike the car industry, however, the reason mentioned was not that the regional aid compensated for the costs of locating in the regions selected; the reason was that significant state aid was offered in many relevant locations, and investors would have borne opportunity costs by locating in an area where no aid was offered. Hence, according to the sector experts, they would not necessarily have located their investment in a more developed region in the absence of aid, but in another region offering investment aid. This shows the difficulty of identifying the counterfactual situation that would have occurred without aid. This also indicates that German Länder appear to be in a "subsidy race" competing with each other to attract investment and set the amount of aid offered accordingly. This assumption was confirmed by the granting authorities themselves. In the three solar industry projects analysed in Germany, the amount of aid was close to the maximum permitted level.

Cases where the aid provided a limited incentive to locate in less developed regions

In the cases of the pharmaceutical industry in Ireland and internal business services in Poland, the beneficiaries acknowledged that regional aid provided no or very limited incentives to locate in less developed regions. In Ireland, most aided investment projects located in existing facilities or in regions with a high density of pharmaceutical industries. In Poland, most aided projects located in cities other than Warsaw or Krakow, i.e. in cities with a lower concentration of business service centres. Lower costs of labour provided incentives to settle in those cities.

However, beneficiaries from the pharmaceutical industry in Ireland and the internal business services in Poland both indicated that regional aid mattered. In the case of the pharmaceutical industry in Ireland, for instance, Irish production plants competed with other production plants within the same company to attract investment projects (in the case of a new product or a new research project to be launched, for instance). In such cases, state aid is a positive element that reinforces the bargaining position of the Irish plant internally, especially as state aid was usually also offered in alternative locations.

In addition, support from local authorities in finding the appropriate location was mentioned as a key location determinant in many projects. The reactivity and proactivity of the local authorities and other partners locally, such as universities, can make a difference in the final decision. This was also the case where regional aid played a role in some of the projects analysed. Seen from the perspective of the firms, the availability of regional aid shows the willingness of the local authorities to support the companies' projects both during the investment and the operating phase (e.g. by maintaining a business friendly environment, investing in training and R&D etc.) Seen from the perspective of the granting authorities, importance was ascribed to contact levels of regional aid facilitates with investors at an early phase of their decision-making process. Such contact increased the level of influence on their decisions.

Cases where the aid provided no incentive to locate in less developed regions

Aid had no impact on the location decisions in the case studies of the pulp and paper industry in Spain and Portugal and of the cement industry in Hungary. In the paper case study, the objective of the investment projects was to enhance the productivity of existing production plants. The aid only provided some incentive relative to the decision to invest. In the cases of both the pulp and paper industry in Spain and Portugal and the cement industry in Hungary, location choices were constrained by high transport costs. Companies had to locate near raw material production sites and, in the case of the cement industry, local final markets. This explains the absence of incentive effect of the aid for the location decision in spite of the significant amount of aid granted to the investor (the higher the transport costs, the lower the agglomeration forces, and the lower the incentive effect of regional aid).

Grant intensity

Some case studies point to aid having had a low incentive effect. Case studies where the incentive effect of the aid appears to have been the lowest are also those for which the amounts of aid and aid intensity offered were the lowest (i.e. pharmaceutical industry in Ireland and internal business services in Poland). However, one cannot easily tell whether 1) actual aid intensity being low results in a low incentive effect or 2) the anticipated incentive effect being low causes low aid intensities. As already discussed in section 8.1.1.3, this illustrates the problem posed by the reverse causality.

Granting authorities may anticipate a low incentive effect because they expect that other location factors far outweigh any kind of incentive effect of the aid – regardless of its extent. This is illustrated by the case studies in Poland and Ireland. In these case studies, granting authorities confirmed that they considered the respective Polish and Irish regions attractive enough for investors with no need to raise attractiveness further by granting high levels of state aid. Thus, it can be argued that if granting authorities anticipate a low impact of the aid on the investor's decision, they will refrain from maximising the aid intensity. The cement case study, however, does not fit this pattern, because the granting authorities did not take into account the attractiveness of the regions from the vantage point of a cement company. As a result, a relatively high aid amount and intensity were offered, while the incentive effect of the aid proved to be limited.

The cases of the internal business services in Poland and the car industry in Slovakia and Hungary are comparable in that low labour costs were key determinants in the location decision. This also explains why investments were located in Central and Eastern Europe. In both case studies, investors faced certain trade-offs. They had to choose between either investing 1) in areas with a high concentration of industries in the same sector - with the advantage of agglomeration economies but the disadvantage of higher labour costs - or 2) in less developed regions - with the advantage of lower labour costs but the disadvantage of higher risks and higher training costs.

In the case of the car industry in Slovakia and Hungary, regional aid compensated for the higher cost of locating in less developed regions. In the case of internal business services in Poland, however, it appears that the higher labour costs in Warsaw and Cracow provided sufficient disincentive to drive investors to less developed areas; as a result, investments went to less developed cities. Possible explanations for the discrepancy between the two cases might be the

size of the investment and the higher risks for the car industry of locating in peripheral areas. On the other hand, internal business service centres are likely to find an adequate labour force in every city in Poland and can – in the case of failure – relocate at much lower cost than the automotive industry. The low aid intensities in the internal business service grants in Poland and the high aid intensities in the car industry in Slovakia both explain and reflect the discrepancies between the two case studies.

The case studies of the pharmaceutical industry in Ireland and the solar industry in Germany are comparable in various aspects. Both case studies include highly R&D-intensive projects; an industrial cluster was present in the countries and regions selected (offering a qualified labour force, ancillary industries, R&D and training institutions, and infrastructures etc.) and this was a key determinant in the location decision. In both cases alternative locations for the investments included regions within the same country and other locations worldwide. However, only in the case study of the solar industry did regional aid matter to a large extent in the location decision. In Ireland, the level of aid granted was significantly lower than the maximum permitted level, while in Germany all projects benefited from an aid amount close to the maximum permitted level. In Ireland, aid amounts are set at the national level, while in Germany aid amounts are set at a regional level. It also appears that German regions may have had lower budgetary constraints than other European regions.

The following table provides an overview of the various determinants and the incentive effect of the aid.

Table 24: Investment Determinants, Aid intensities

	Aid amount	Aid intensity	Level of regional aid compared to RAG ceiling	Investment drivers	Incentive effect for invest. decision	Location drivers	Incentive effect on location decision
Pharmaceutical industry (Ireland)	Low	Low	Lower than ceiling	Rising demand, availability of new technologies, efficiency-seeking	Low	Pre-existing operations on site, availability of skilled labour force, presence of leading cluster	Low
Solar industry (Germany)	High	Medium	At ceiling	Rising demand, availability of new technologies, high profit margins, efficiency seeking	Low/ Medium	Pre-existing operations and availability of land at the site, skilled labour force and proximity to ancillary industries (cluster)	Medium
Automotive industry (Slovakia and Hungary)	High	Medium	Close to ceiling	Need to adapt to evolving demand and create new production lines for new products, efficiency seeking	Low/ Medium	Low labour costs, quality of the labour force, availability of transport infrastructure	Medium
Internal business services (Poland)	Very low	Low	Lower than ceiling	Efficiency-seeking through cost reduction, increased capacities and enhanced quality of services	Low	Low labour costs, quantitative and qualitative availability of labour force	Low
Cement industry (Hungary)	Medium	Medium	Lower than ceiling	Rising demand, efficiency-seeking	Low	Availability of raw material, geographic proximity to and accessibility of local markets	Low
Pulp and paper industry (Spain and Portugal)	Medium	Medium	Close to ceiling	Rising demand, need to increase efficiency to adapt to increasing competition	Medium	Pre-existing operations on site, transport infrastructure and accessibility, availability of a skilled labour force and of raw material	Low

8.3 Consequences of the investments in terms of regional and employment benefits and externalities

This section provides answers to the following questions:

2) Assess the consequences of the investments in terms of regional and employment benefits and externalities

a) What were the main regional benefits and externalities related to the regional investment aid? Can these be quantified?
   i) Did the regional investment aid create direct and indirect jobs and in which proportion? (direct/indirect jobs). To what extent can this job creation be considered as structural?
   ii) Did regional investment aid trigger additional training and/or R&D?
   iii) What were the main types of spill-over in terms of knowledge and economic activity (clusters)?
   iv) Is there any indication on the long term regards the maintenance of the investment in the regions once the mandatory period is over (5 years or less according to the type of beneficiary)?

b) Did the aid provide 'value for money', i.e. did the regional benefits exceed the aid amount?

c) What were the main drivers for the above positive effects? Were they project-specific or region specific (e.g. specialisation via clusters vs. diversification of the economy)?

8.3.1 Effects in terms of direct jobs

Gross change in direct jobs

Most of the aided investments contributed to the creation of several hundred jobs at the investment sites. There are two exceptions, however: the pharmaceutical industry in Ireland and the pulp and paper industry in Spain.

As far as the pharmaceutical industry in Ireland is concerned, the number of jobs created is relatively low because investing companies changed their initial plans. Only two of seven projects analysed were completed (GlaxoSmithKline Dungarvan and Teva) and none met their initial targets. As the pharmaceutical industry is characterised by high-risk development activities this is not unusual. In addition, the sector has experienced stronger concentration as a result of mergers and acquisitions over the past few years. This restricted some activities in the Irish plants as a result. As mentioned above, these peculiarities of the industry indicate that regional aid did not have any incentive effect for the investors in sustaining their capital or human investment. In accordance with the Irish granting agreements, aid was returned to the granting authorities by the investors in several cases.

As for the pulp and paper industry in Spain and Portugal, most investments did contribute to the creation of new jobs, yet the number of jobs created is lower in relative terms than in other case studies. However, when looking at the employment trends of the sector overall, large scale job losses were not unusual. Against this background, the slight increases in the number of jobs at the Spanish and Portuguese production sites analysed appear to be a quite positive outcome. The impact of the aided investments can also be measured in terms of the number of jobs safeguarded (see below).

In all other case studies, the projects selected contributed to significant job creation - several hundreds of jobs at the investment sites and up to a thousand or more in a few projects (e.g. Reuters Europe S.A. in internal business services in Poland, Getrag Ford Transmission and Volkswagen in the car industry in Slovakia, and Ersol Solar Energy in the solar industry in

Germany). The number of newly created jobs usually corresponded to the targets set in the agreements with the granting authorities.

In the great majority of investment projects, those employees brought to the region as 'expatriates' represent up to five percent of the direct jobs created. The share of 'expatriates' in the total number of jobs created exceeds five percent in only three investment projects.

Jobs safeguarded

Systematic evidence of jobs safeguarded on the investment sites was not collected, mainly because it did not seem to be a relevant indicator either for the granting authorities or the European Commission. Furthermore, safeguarded jobs are hardly mentioned in the RAG. However, the project sample does include several instances of investments at existing sites. These have contributed to safeguarding jobs in the respective regions.

The most remarkable evidence of jobs safeguarded can be found in the pulp and paper industry in Spain and Portugal and in the pharmaceutical industry in Ireland. In both case studies, enhancing productivity and competitiveness of existing sites was one of the main investment drivers. In the case of the pulp and paper industry in Spain, for instance, SAICA's investment generated 54 jobs instead of 110 as planned, but the production plant has increased its productivity drastically as a result of the investment. Hence, the sustainability of jobs at the site was increased.

In the pharmaceutical sector in Ireland, the investment projects of Teva, SmithKline Beecham and GlaxoSmithKline Dungarvan were partly or fully completed when the activities at the sites were restructured. The restructuring resulted in a reduction of the number of jobs at the sites. However, it also appears that the investments contributed to enhancing the competiveness of the production sites and fostered the sustainability of the remaining jobs because most activities impacted by the investments were not included in the jobs containment programmes and on the contrary flourished during the years after the investments.

The cases mentioned above also illustrate diverging practices among the granting authorities in terms of the regional aid agreement and payment. In Spain and Portugal, targets in terms of job creation were not always set and granting authorities systematically distributed the whole amount, implicitly acknowledging that jobs were safeguarded. On the contrary, the Irish granting authority did not pay aid to or claimed back the grants from beneficiaries that did not meet their contractual targets in terms of the total number of jobs created at the relevant sites.

Improved quality of jobs and training

Projects with R&D components are those which offer the strongest evidence of improved quality of jobs (in terms of the degree of skill and qualifications necessary). The most striking examples can be found in the solar industry in Germany and in the pharmaceutical industry in Ireland. In the case of Eli Lilly in Ireland, for instance, 50% of the jobs created for the new biotech facility are retooled employees who previously worked on the manufacturing of small molecules. In order to make the labour force operational, some €4 to 5 million was spent on upfront training.

Improved quality of jobs is often linked to the sustainability of jobs and jobs safeguarded, since it staves off the risk of relocation of activities. The findings in the pharmaceutical industry in Ireland are a good example of this: all projects consisted of developing capacities and activities in R&D and product development (pre-clinical and clinical trials), launch manufacturing and biotech-based products. These activities require a highly skilled labour force as they involve complex activities and processes. Additionally, they contribute to the Irish pharmaceutical industry's attempts to move up the value chain and maintain its competitive advantage against locations offering lower labour costs.

The quality of jobs was also improved as a result of the investment projects in the internal business services sector in Poland. While many beneficiaries pointed to the overall high quality of the jobs they created (a large majority of the new employees have a higher education degree), beneficiaries also acknowledged the need to continue investing and increasing the complexity of

services and functions if they are to remain competitive with business centres in areas with a cheaper and less skilled labour force (e.g. Egypt, Tunisia, India).

Generally, all beneficiaries indicated that they had been spending significant amounts on training the newly hired labour force. However, the level of training expenditure differs widely between projects and case studies. Apart from Eli Lilly from the pharmaceutical sector in Ireland, the highest level of training expenditure per employee can be found in the paper sector in Spain and Portugal. This can be explained by the fact that all the projects involve the introduction of new equipment and processes necessitating training of the labour force.

8.3.2 Effect in terms of indirect jobs and additional demand in the regions

Overall, substantial positive effects in terms of indirect jobs and additional demand in the regions can be observed in most cases.

In all projects, the beneficiaries declared that more than 80% of the employees in direct jobs created lived within a 50 km radius of the site. This suggests that the aided investments have strong impacts locally, both in terms of employment and of other induced effects.

In terms of the indirect impact of the investment on jobs and additional demand in the regions, the data collected does not cover all projects. Thus, it should be used cautiously when making further assessments. However, some patterns emerge from the data available.

The evidence collected indicates great discrepancies in terms of the indirect impact of the investments. For instance, the share of additional turnover spent at local suppliers is low in the pharmaceutical industry in Ireland. This is supported by an analysis of the sector's input-output data. On the other hand, the additional turnover generated by the new investments is relatively high compared to other cases.

Both beneficiaries and the granting authority consider that investments in the pharmaceutical sector generated a high spill-over effect on suppliers. This was especially true of innovation capacities and with regard to the follow-on investment suppliers carry out to acquire specific skills demanded by the industry.

The share of investment volume and additional turnover spent at local suppliers is particularly high in the internal business services in Poland, on the other hand. However, it corresponds to low overall levels of expenditures. Hence, although highly beneficial to the regions in terms of direct jobs, the investments in the internal business services generate limited indirect impact. Positive impacts on suppliers in terms of additional investment can, however, be observed locally in IT services and real estate.

Nevertheless, almost all beneficiaries deemed their investment to have had a positive impact on their supplier base. Furthermore, in most projects beneficiaries considered their investments to have induced investments from their suppliers within a 50 km radius of the site. These investments went into equipment or new facilities at least. However, some projects also provide precise examples of suppliers establishing near the production facilities and/or creating new jobs to satisfy the demand induced by the beneficiaries' investments (e.g. in the case of SAICA in the pulp and paper industry in Spain or Ersol in the solar industry in Germany).

The most striking indirect impacts of the investments on the supplier base can be found in Spain. This is the result of a voluntary strategy by the granting authorities. They decided to fund projects with a relatively low number of newly created direct jobs compared to large amounts of aid – the planned and paid amounts of aid per new employee are by far the highest among the whole project sample in the case of the pulp and paper industry in Spain and Portugal. The granting authorities and beneficiaries considered that the investment projects have had a high impact on the regions, not only in terms of jobs safeguarded on site (due to higher productivity and thus, increased competitiveness of the facilities), but also in terms of indirect jobs (due to higher productivity and increased production volume). The share and amount of additional

turnover spent at local suppliers is relatively high in investment projects from the case study of the paper industry.

Finally, apart from an anecdotal case in the solar industry in Germany (Masdar built a solar plant for presentational purposes at its site, which induced a €25 million contract with a local client), no significant impact of the investments on the client base within a 50 km radius could be observed.

8.3.3 Other effects

Effects on R&D

As already indicated above, the most significant impacts on R&D activities in connection with the investment projects can be found in the case studies of the pharmaceutical industry in Ireland and the solar industry in Germany, where all aided projects were connected to a regional or inter-regional industrial cluster and included important R&D components. To a lesser extent, some investment in R&D could also be identified in the case of the pulp and paper industry in Spain and Portugal, also in relation to an industrial cluster.

Cooperation with higher education institutions

Evidence of enhanced cooperation with local higher education institutions can be found in almost all cases, with the exception of the cement industry in Hungary.

Cooperation between companies and higher education institutions in R&D activities can be found in the pharmaceutical industry in Ireland, the solar industry in Germany and the pulp and paper industry in Spain and Portugal.

Evidence of cooperation with higher education institutions locally can also be found in the cases of the internal business services in Poland and the car industry in Hungary and Slovakia. These case studies differ from the latter in the sense that they induce cooperation on education rather than R&D. The objective of these cooperation activities is to ensure that the universities tailor their curricula to the needs of the local employers. This involves some knowledge transfer.

Spill-over and clustering effects

The most striking evidence of spill-over effect can be found in the pharmaceutical industry in Ireland and the solar industry in Germany.

In Ireland, investments have contributed to sustaining intra-sectoral spill-over effects, in that they contribute to the development of the pharmaceutical industry in the Republic through activities and capabilities that generate and deliver higher value. This development allows Irish firms to move up the value chain. As a result, the competitiveness and sustainability of the Irish pharmaceutical industry is secured. A negative impact, however, is the fact that such intra-sectoral spill-over effect deepens the gap between Cork and other peripheral regions in Ireland, where the concentration of pharmaceutical industries is lower and where investments are more difficult to attract in spite of regional aid. Similar observations can be made in the case study of the pulp and paper industry in Spain and Portugal.

Intra-sectoral spill-over effects could also be found in the solar industry in Germany. However, it appeared that the investment regions had a lower level of specialisation than the Irish and Spanish regions (and in particular, the El Burgo del Ebro region in Spain). Hence, rather than sustaining spill-over effects and clustering, investments in Germany have contributed to establishing a *new* regional solar energy cluster in eastern Germany. The construction of large R&D centres by Masdar and Ersol in Thuringia, focusing on new and promising technologies and with yearly budgets of €2 million to more than €10 million (in the case of Ersol), are considered to be major contributions to the development of the solar industry in the region by the regional granting authority.

Intra-sectoral agglomeration effects can also be observed in Poland, where a cluster of offshore business services has been developing rapidly, especially in Warsaw, Krakow and Wrocław. In addition, a certain degree of specialisation can be observed locally, such as finance and

accounting in Poznan. However, it seems as if the firms are not interested in agglomeration economies, since these also tend to increase costs of labour and office space.

In the case study of the car industry in Slovakia and Hungary, no intra-sectoral spill-over effect could be observed, but the companies' large investments have attracted or are expected to attract other investments from other industries in the regions. The example of Getrag Ford is interesting in this regard, as it was the first company to establish in the new industrial park of Kosice. Fifteen other companies from different sectors decided to settle in this area within a short period after Getrag Ford established there. Similarly, Mercedes-Benz' investment in Dél-Alföld is perceived to be a flagship for further investment in the region by the granting authority. This illustrates how agglomeration effects are not only generated by external economies of scales, but also by the risk factor, which is considered by investors to be lower when an industry is already established in a relevant location. Taking this into consideration, the car industry case study investors in Slovakia and Hungary selected locations with a low concentration of car industries in order to avoid congestion effects and higher labour costs.

Finally, it should be noted that the firms that received regional aid usually demonstrate good will and cooperate with the granting and/or local authorities when potential investors are visiting the regions. These word-of-mouth recommendations contribute positively to spill-over effects as well.

Sustainability of the presence in the region

Investments in the regions appeared to be sustainable in most cases. In many of the projects in the internal business services in Poland and in the pulp and paper industry in Spain and Portugal, follow-on investments were already planned and completed at the time of data collection.

The case study on the pharmaceutical industry in Ireland, however, shows that large and capital intensive investments do not necessarily guarantee the sustainability of the production activities and jobs in the regions. On the contrary, the project sample includes many projects, in which the investment started but was then cancelled or the investment was completed but then part of the operations concerned by the investment were closed down. In order to avoid such volatility, according to the granting authority, sector experts and beneficiaries, the pharmaceutical industry would need to focus its investments on high added value activities, which cannot be easily transferred to any other region or country in the world (e.g. R&D activities).

In spite of follow-on investments, some beneficiaries expressed similar concerns in the case of the internal business services in Poland, since such services are extremely mobile and could be easily transferred to areas where the labour force is cheaper. In the light of this, to make jobs sustainable, it would be necessary to continue investing and increasing the complexity of functions.

Table 25: Impacts of the investments in terms of regional and employment benefits and externalities

	Job creation	Jobs safe-guarded	Quality of jobs	Indirect jobs	Impact on R&D	Spill-over effect	Follow on investments	Cluster-specific impacts
Pharmaceutical industry (Ireland)	Low	Medium	High	Low	High	High	No	Yes
Solar industry (Germany)	High	Low	High	Medium	High	Medium/ High	n/a	Yes
Automotive industry (Slovakia and Hungary)	High	Low	Low	High	Low	Low	No	No
Internal business services (Poland)	Medium	Low	Medium	Low	Low	Medium	Yes	No
Cement industry (Hungary)	Low	Low	Low	Medium	Low	Low	No	No
Pulp and paper industry (Spain and Portugal)	Low	High	Low/ Medium	High	Medium	Medium	No	Yes

8.3.4 Value for money of regional aid

As seen, all investment projects had positive impacts on the regional economies. In order to assess the value for money of the regional aid, however, one needs to look first at the incentive effect of the aid. Indeed, where the incentive effect of regional aid is low, low value for money is to be expected. Only when the aid had incentive effects, can one compare the cost of aid to the benefits generated for the regions.

Value for money of regional aid where the incentive effect of the aid is limited

The case study on the cement industry is the only one where the regional aid clearly did not provide value for money. The cement industry needs to locate plants close to quarries and to the final market due to high transportation costs. In economic geography, high transport costs mean lower agglomeration effects. Furthermore, production factors are not mobile and tend to be well spread across the territory. Hence, one could expect a limited incentive effect by directing the aid to a specific area, a situation that was confirmed by the relevant beneficiary. In spite of this inbuilt likelihood of ineffectiveness and inefficiency, the projects were granted a significant amount of aid.

The case studies on the pharmaceutical industry in Ireland and internal business services in Poland show that such failure can be avoided with carefully designed terms of reference. In Ireland, for instance, regional aid supports pharmaceutical industrial plants to maintain their competitiveness on a worldwide market. The incentive effect of the aid in the location decision is limited. This is illustrated by the fact that almost all investors changed their plans before, during or after the investment phase in spite of the investment costs and the loss of the aid. However, value for money is ensured through carefully set amount of aid and tight agreements that allow the granting authority to ask for the grants to be paid back if the objectives in terms of job creation or investment schedule are not met. Even partially achieved projects, which generated some jobs, do not receive payment of the aid.

In the case of the internal business services in Poland, the terms of the agreement are slightly more flexible; there are some examples where the investment was delayed and the aid agreement renegotiated. However, the incentive effect of the aid is assessed upstream and, while

the incentive effect was very low, so were the levels of regional aid. Compared to any other case studies, the internal business services in Poland exhibit the lowest costs per jobs created.

In the case of the pharmaceutical industry in Ireland and the internal business services in Poland, the fact that aid was being paid without any incentive effect does not necessarily mean that there was no benefit. In both cases, regional aid was used as part of a wider package, as a flagship product to enter into dialogue with the investors and promote regional development objectives. In addition, in both cases European regions were competing to some extent at least with regions outside Europe. In both cases, regional aid was also used to promote wider strategic objectives at national level. For example, in Ireland it aims at supporting the development of higher added value activities in the Irish pharmaceutical industry, in order to foster its competitiveness against low cost locations. In Poland it accompanies the restructuring of the local industry through job creation in tertiary sectors, which offer good employment prospects for a young and well educated labour force.

Value for money of regional aid in case where the incentive effect of the aid is patent
For investment projects in which the incentive effect of the aid on the investment or location decisions was patent, one may start to compare benefits to costs. However, considering the limits to the quality, comprehensiveness and comparability of the data collected, this would not lead to credible results.

Instead, it is possible to compare the costs of direct jobs created to the amount of aid paid. Here, one can see that the amount paid per job ranges between from some €50,000 in the car industry in Slovakia and Hungary to €200,000 in the solar industry in Germany. The higher costs in the latter could be justified by the higher quality of jobs, although discrepancies can also be attributed to different project status at the time of the data collection (the planned aid amounts per jobs are quite comparable between the two cases). Taken with the additional effects for the region (especially in terms of spill-over effects) and the fact that sustainability of jobs can be reasonably expected, in both cases regional aid offered reasonable value for money.

In the two case studies mentioned above, it appears clear that a “subsidy race” was avoided thanks to regional aid ceilings. However, on the question of whether higher efficiency could have been achieved through lower regional aid ceilings, no clear answer can be provided.

In the case studies on both the car industry in Slovakia and Hungary and the solar industry in Germany, regional aid contributed to attracting investments to less developed regions. However, there are also incentives to locating in less developed regions other than regional aid. In the case of the car industry, lower labour costs provided a strong incentive for firms to locate investments in least developed regions. Furthermore, there is some evidence that the aid overcompensated for the additional costs induced by these locations. Hence, at least for the two investment projects in the car industry that received the highest permitted levels of aid, lower aid ceilings might have had the same impact.

It is also appropriate to look at whether alternative locations were considered worldwide. In the case of the solar industry in Germany, lower labour costs were not mentioned as a key driver of the location decision. Instead, regional aid proved to be a clear incentive to locate in a less developed region. However, all investment projects were also granted the highest permitted level of aid permitted by the RAG. This was a clear consequence of a ‘race to the bottom’ fuelled by the competition between German Länder. However, alternative locations not only included other regions in Eastern Germany or Central and Eastern Europe, but also locations in other parts of the world where the solar industry is also heavily subsidised. For this reason, it is difficult to tell whether lower aid ceilings would have generated the same impact. With lower ceilings, the investments might have been made outside the EU.

The case study on the pulp and paper industry in Spain and Portugal is quite unique in that the number of newly created jobs is relatively low, resulting in extraordinarily high costs per job created. However, the effect of the aid can also be measured in terms of jobs safeguarded. This, however, does not seem to be a common practice for granting authorities (evidence of jobs

safeguarded could also be identified in Ireland, for instance, but they are not valued by the granting authority) and the RAG do not encourage this practice either.

An EU perspective on the value for money of regional aid in the event of relocation of activities

Value for money from an EU perspective is even more difficult to assess than from a regional angle. This is especially the case because it is difficult to detect whether jobs newly created in less developed regions correspond to jobs lost in other regions of the EU.

If one takes the rationale of the RAG, the jobs created in less developed regions are valued more highly than those lost in more developed regions (e.g. in the case of the paper industry where beneficiaries from Spain and Portugal benefited from a competitive advantage relative to their competitors from northern Europe; or in the case of the internal business services where jobs were relocated from Western Europe to Poland, or even possibly lost altogether). The benefits of the investments on industry at EU level can also be taken to account (e.g. in the case of the car industry in Slovakia and Hungary, where investments were said to foster the competitiveness of car firms and sustain jobs in Germany). Finally, consideration can also be given to whether jobs would have been transferred outside Europe in case of no aid.

The questions above may provide a starting point for further assessments. The net impact of the investments was not assessed because it was beyond the scope of this study, however, and the issues raised above therefore remain unresolved.

8.4 The distortive effects of aid for competitors and/or other regions

This section provides answers to the following questions:

3) Analyse the distortive effects of aid for competitors and/or other regions
- a) What were the main effects for competitors?
- b) What are the effects for other regions?

8.4.1 Impact on competition

It has proved difficult to evidence negative effect of the aid for competitors, and for this reason two different routes have been taken to identify distortions: on the one hand, the market structure and performance where examined, in order to detect “potential” negative effects in terms of market distortion; on the other hand, competitors where interviewed in order to detect any evidence of negative impact of the aid (or aided investment) on their activity.

Potential negative effects of aid in terms of market distortion

In spite of a majority of cases being notified to the Commission in accordance with the EC Treaty and the RAG, there are quite a few investment projects that raise concerns. At industry case study level, the aid awarded to investors in the cement industry in Hungary, and the Pulp and Paper industry in Spain and Portugal are two such cases.

As far as the cement industry is concerned, the analysis of the market indicates that the beneficiaries benefit from rather dominant market positions and entry barriers that prevent other companies from competing on the local and global markets. In addition, the cement market in Hungary has been in absolute decline and experiencing overcapacity over the last few years, while one of the two investment plants that was implemented as planned started production. Added to the fact that the aid provided no incentive to invest or locate, hence provided an additional source of revenue to the beneficiaries rather than compensating potential loss for investing in a particular region, there is little doubt that the aid has been distortive.

The paper industry in Spain and Portugal offers another striking example of potentially distorting aid. In the context of increasing international competition, the pulp and paper market has been characterised by drastic job losses and productivity gains, it appears that investment aid

contributed to maintain inefficient market structures and gave a competitive advantage to the beneficiaries who were able to protect their employment levels and market position.

This is an interesting finding, because the pulp and paper industry in Spain and Portugal is the only case study where regional aid appeared to have had a clear, although marginal impact on the decision to invest as such. This thus suggests that investment projects for which the incentive effect of the aid on the *investment* decision was significant had the strongest negative impact on competition. This is not very surprising since, in theory, aid which provides an incentive to invest, is not compensating for additional costs but is simply increasing investment returns that were initially low in any event. In this case, the aid incentive is not "neutral", while on the contrary the aid, which provides an incentive to locate in a relevant region, is supposedly compensating for the costs of locating in a more handicapped region.

Meanwhile, the incentive effect of regional aid is certainly higher in declining industries since this is where regional aid can effectively support investments in eligible regions that otherwise would not have be made. But these are also the cases that the potential negative impact on competition can be the highest: this appears to be an inherent contradiction of the RAG.

Two "isolated" state aid cases are also source of high concerns: Wacker Chemie received the second highest aid amount in the whole sample of 28 investment project analysed, while its occupies a dominant position on a market characterised by high concentration and barriers to entry, as well as inefficiencies (especially in terms of over-capacity). Volkswagen received aid while the company is occupying an increasingly dominant position within a contracting market.

Table 26: Potential distortive effects of aid for competitors

	Market segments	Market power		Market inefficiencies		Critical aid cases
		Market shares	Entry barriers	Market decline	Over-capacity	
Pharmaceutical industry (Ireland)	-	Medium	High	No	No	-
Solar industry (Germany)	Polysillicon	Large	High	No	Yes	Wacker Chemie
	Wafers	Medium	Low	No	n/a	-
	Modules	Small	Low	No	n/a	-
Automotive industry (Slovakia and Hungary)	Urban Small Cars	High	Medium	Yes	n/a	Volkswagen
	Compact Cars	Large	Medium	Yes	n/a	-
	Transmissions	Large	Medium	No	n/a	-
Internal business services (Poland)	-	n/a	n/a	n/a	n/a	-
Cement industry (Hungary)	-	High	High	Yes	Yes	All
Pulp and paper industry (Spain and Portugal)	Pulp	Low	Medium	No (Yes in EU)	Yes	All
	Paper	Low	Medium	No	Yes	All

Potential negative effects of aid when the aid incentive for the investment and investment location is low

One important point should be added to the analysis of the potential market distortion due to aid. Basically, the core rational of state aid under the regional aid guidelines is to compensate for the costs of investing in less developed regions. As seen above, the incentive effect of the aid is generally low, and investors usually make their investment and location decisions based on hard location factors in view of maximising their investment returns, regardless the aid. Hence, when aid has no or limited incentive effect for the investment or location decision it is basically additional revenue for the beneficiaries, which is potentially distortive if it does not compensate for any additional costs. Such distortive effect is all the more significant that the aid amount or intensity is high.

These reflections shed additional concerns about market distortion for all investment projects in the Automotive industry in Slovakia and Hungary. In this case, companies have strong incentives to invest in Central and Eastern Europe as efficiency seeking is one of the reasons for their investment, due to lower labour costs compared other regions not eligible or having a lower aid intensity ceiling permitted by the RAG. Meanwhile, it has been observed that the level of aid awarded is high[323], while the incentive effect of the aid for the investment or location decisions is not highly evident, or seems to be the result of a race to subsidy between eligible regions (meaning that if no aid at all was offered by any region, there is no certainty that the location decision would have been different).

The case of the Solar industry in Germany is also of concern. This is not necessarily because lower labour costs provided incentive to locate in Eastern Germany – although this could also be discussed – but mainly because the presence of pre-existing operations at the sites (enabling economies of scale), and the presence of a solar cluster in relevant regions (enabling agglomeration economies), already provide strong incentives to locate there. In this case, the level of aid awarded is also high, and the granting authorities find themselves in the same kind of race for subsidies as in the Automotive industry case study.

These considerations call for a better assessment by the granting authorities of the true incentive effect of the aid, and possibly more detailed consideration of the industry sectors by the RAG.

Evidenced negative effects of aid for competitors

Beyond the risk of distortion identified above, actual evidence of negative effect of the aid is scarce. Most competitors interviewed did not express any concerns about the negative effect of the aid on their activity. Yet, one may question whether competitors' answers are unbiased, since competitors are potential beneficiaries in the future.

In a few instances, competitors did raise issues about the negative impact of the aided investment on their activity: this concerns Volkswagen in the case of the automotive industry in Slovakia; Nostra in the case of the cement industry in Hungary; and more generally the aided investments in the case of pulp and paper industry in Spain and Portugal. Only in the latter case, however was the negative impact of the aided investments for competitors attributed to the aid recived. This is consistent with the fact that in this case, the aid appears to have had an incentive effect for the investment decisions.

Other negative impacts for competitors

The internal business services case study in Poland provides an interesting example in which competitors were affected locally by the aided investments. Although internal business services centres operate on a global market, investors are competing for labour force and office space locally. The new establishment of a business centre in a city can have a strong impact on labour demand and create congestion effects that have negative effects on competitors as prices increase. This ultimately generates some dispersion forces and investments will tend to locate in cities where the concentration of business centres is lower. This is a positive outcome in terms of territorial cohesion but can also be detrimental to the productivity of the business units locally.

[323] Aided investment project in internal business services in Poland are not a source of major concern, simply because the level of awarded aid is particularly low.

Such congestion effects could be observed in Poznan, where two investment projects were analysed. Because the aid had no impact on the location decisions, however, such negative impact on competition cannot be attributed to the aid.

Similar impact could be observed in the case of the cement industry, where Nostra's new plant increased competition on the local job market, which resulted in an increase in wages in another production plant locally. Here again, the negative impact on competition cannot be attributed to the aid, which had no impact on the location decision.

8.4.2 Impact on other regions

In the case studies on the car industry in Slovakia and Hungary and on the internal business services in Poland, negative impacts on other regions in the EU can be expected. Both case studies concern investments for which the cost of labour was a decisive determinant, and hence the decision was made to locate the investments in Central and Eastern Europe.

In the internal business services, the gross increase in direct jobs in the regions of investment corresponded to a large extent to jobs transferred from other EU locations to Poland. Hence, job creation in Poland induced job losses elsewhere. With only a few exceptions, the affected regions were more developed regions in Western Europe. The net effect, although assumingly negative, cannot be estimated.

In the case study on the car industry in Slovakia and Hungary, some of the jobs were also relocated from Germany to Central and Eastern Europe, but the net impact seem to be lower than in the Polish case study. In one project, the employees in Germany who were affected by the investment were retooled in other project lines. In another project, the investment in Hungary was beneficial to the entire company and contributed to increasing the sustainability of jobs in all company's production plants.

With the exception of the latter case, the net effect of the investment projects on employment at EU level could not be assessed. This issue has been discussed in section 8.3.4 above. The impact on "missed-out" regions appeared to be extremely difficult to establish and no evidence of such impact could be collected.

APPENDIX 1
LIST OF INTERVIEWS CONDUCTED

Categories / Cases	Beneficiaries		Experts		Granting authorities (names)		Competitors
	Name of the company	Inter-viewed	Organisation	Name			
Pharmaceutical Industry - Ireland	Amgen Technology Ltd	Yes	Irish Business Employers' Confederation (IBEC) (Industry)	Matt Moran	Investment and Development Agency (IDA)	John O'Brien Gerry Kenny Blaithin Moloney Breda O'Sullivan Tony Gough	No competitors interviewed.
	Pfizer Ireland Pharma. Ultd	Yes					
	Eli Lilly S.A.	Yes	FAS Pharma/ Biopharma Process Training Facility (Industry)	Valerie Cowman	Department of Jobs, Enterprise & Innovation (DJEI)	Clare Dunne Martina Murray Ronnie Breen	
	SmithKline Beecham Ltd (GSK Cork)	Yes					
	Ivax International BV (Teva Pharma. Industries Ltd)	Yes	Forfás (Developemnt agency)	Maria Ginnity	IDA Cork	Ray O'Connor	
	GlaxoSmithKline Dungarvan Ltd (GSK Dungarvan)	Yes					

Categories / Cases	Beneficiaries		Experts		Granting authorities (names)		Competitors
	Name of the company	Inter-viewed	Organisation	Name			
Solar Industry - Germany	Ersol Solar Energy AG	Yes	SolarValley GmbH (Industry)	Mr. Frey	Thüringer Aufbaubank	Mr. Odebrett	One major competitor interviewed
			Chamber of Commerce and Industry of Southern Thüringen (Authority)	Mr. Löffler	The State Development Corporation of Thuringia (LEG)	Mr. Albert	
	Masdar PV GmbH	Yes	Pro Terra Consulting (Industry)	Mr. Kleinschmitt	Ministry of Economy and Labour of Sachsen	Ms. Weskamm Ms. Rösner Ms. Hüdepohl	
	Wacker Polysilicon	Yes			Ministry of Economy, Labour and Technology of Thuringia	Mr. Beutel	

Categories / Cases	Beneficiaries		Experts		Granting authorities (names)		Competitors
	Name of the company	Inter-viewed	Organisation	Name			
Automotive Industry - Hungary and Slovakia	GETRAG FORD Transmissions, Cologne	Yes	Automotive Industry Association of the Slovak Republic (Industry)	Pavol Prepiak	Ministry of Economy Slovakia	Miroslav Ivan Jozef Dutko	Three main competitors from the top ten car-makers worldwide.
			Tower Automotive (Industry)	Marián Haruštiak	SAMO (State Aid Monitoring Office, Ministry of National Development) Hungary	Tari András Dr. Hargita Eszter Göncz Ildikó	
			VÁTI, Ministry of National Economy Hungary (Authority)	Nagy András			
	Mercedes-Benz Manufacturing Hungary	Yes			Department of Strategic Investment Promotion, Ministry of National Economy Hungary	Henter Ágnes	
					Ministry of National Economy, Office of the Minister of State for Parliamentary Affairs Hungary	Prof. Dr. Cséfalvay Zoltán	
	Volkwagen	No			HITA, Hungarian Investment and Trade Agency	Somfalvi-Peténi Györgyi Ba Milán	

Categories / Cases	Beneficiaries		Experts		Granting authorities (names)		Competitors
	Name of the company	Inter-viewed	Organisation	Name			
Internal Business Services - Poland	Carlsberg Accounting Service Centre Sp. z o. o.	Yes	City Poznan (Municipality)	Marcin Przylebski Katja Lozina Dominika Blaszyk	Ministry of Finance	Marek Popiolek Agnieszka Palka	One major competitor interviewed
	UniCredit Processes and Administration S.A.	Yes					
	Reuters Europe S.A.	Yes					
	MAN Accounting Center Sp. z o. o.	Yes					
	Citibank International Plc Oddzial z Polsce	Yes	Association of Business Service Leaders in Poland (ABSL) (Authority)	Wioletta Bobryk	Polish Information and Foreign Investment Agency	Rafal Szajewski	
	State Street Services (Poland) Limited Sp z o. o.	Yes					
	UPS Polska Sp. z o. o.	Yes					
	KPIT Infosystems Central EUROPE Sp. z o.o.	No					

Categories / Cases	Beneficiaries		Experts		Granting authorities (names)		Competitors
	Name of the company	Inter-viewed	Organisation	Name			
Cement Industry - Hungary	Holcim	Yes	VÁTI, Ministry of National Economy Hungary (Authority)	Nagy András	SAMO (State Aid Monitoring Office, Ministry of National Development) Hungary	Tari András Dr. Hargita Eszter Göncz Ildikó	Two major competitors interviewed
					Department of Strategic Investment Promotion, Ministry of National Economy Hungary	Henter Ágnes	
	Nostra Cement	yes	City of Királyegyháza (Municipality)	Ferenc Grim	Ministry of National Economy, Office of the Minister of State for Parliamentary Affairs Hungary	Prof. Dr. Cséfalvay Zoltán Szigeti Ádám	Four major competitors were interviewed.
					HITA, Hungarian Investment and Trade Agency	Somfalvi-Petényi Györgyi	

Categories / Cases	Beneficiaries		Experts		Granting authorities (names)		Competitors
	Name of the company	Inter-viewed	Organisation	Name			
Pulp and Paper Industry - Spain and Portugal	Papelera Guipuzcoana de Zikuñaga	Yes	Association of the Paper Industry of Portugal (Industry)	Ms. Marta Souto Barreiros	Portuguese Business Development Agency (AICEP)	Dr. Rita Araújo	
	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	Yes			Department of Industry, Trade and Tourism of the Basque Government	Mr. Agustín García	
	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel S.A.	Yes	University of Alcalá (Academia)	Mr. Federico Pablo Martí	General Secretary for Regional Incentives)	Ms. Pilar Soler Oroz	
	Papeles y Cartones de Europa S.A	Yes			Innovation and Financing Agency of Castilla León	Ms. Beatriz Casado Saenz	
	Portucel – About the future – Empresa produtora de papel	No			Gobierno de Aragón	Fernando Latorre	

APPENDIX 2
OVERVIEW OF PROJECTS

Table 27: Basic Data of Pharmaceutical Industry Case Study in Ireland

Beneficiary	Type of investment	Region	Procedure	Total eligible sum nominal in € million	Instrument	Aid amount granted in € million nominal value	Targeted area Art. 107 (3) (a)/(c)	GGE/NGE	Max GGE/NGE permitted at regional level	Max GGE/NGE permitted in specific cases	GGE granted
Servier SAS (Supram Ltd)	New establishment	South East	MF 44/2006	115.00	Direct grant	3.88	c	NGE (except allocated: GGE)	20%	13.90%	3.93%
Amgen Technology Ltd	New establishment	South West	MF 54/2006	265.00	Direct grant	15	c	NGE (except allocated: GGE)	20%	9.90%	5.66%
Pfizer Ireland Pharma. Ultd	New establishment	South West	MF 59/2007	140.00	Direct grant	8.4	c	GGE	10%	6.30%	6.00%
Eli Lilly S.A.	Diversification	South West	MF 62/2007	400.00	Direct grant	15	c	GGE	10%	4.40%	3.75%
Smithkline Beecham Ltd	Extension, Diversification, Change in production process	South West	MF 82/2007	377.00	Direct grant	2.04	c	GGE	10%	4.50%	0.54%
Teva Pharma. Industries Ltd (Ivax International BV)	Extension, Change in production process	South East	MF 2/2008	65.00	Direct grant	5	c	GGE	10%	8.80%	7.69%
Glaxosmithkline Dungarvan Ltd	Extension, Diversification, Change in production process	South East	MF 42/2008	97.00	Direct grant	1.35	c	GGE	10%	7.60%	1.39%

Table 28: Impact of Investments in Ireland

Beneficiary	Status	Aid amount paid in € million	Number of new direct jobs during operating phase				
			Planned	Achieved *(Granting Authorities Dec. '10)*	Achieved *(Beneficiary June '12)*	Aid / Job in € *(planned)*	Aid / Job in € *(achieved)*
Servier SAS (Supram Ltd)	Cancelled	-	155	0	N/A	25,032	-
Amgen Technology Ltd	Cancelled	-	300	0	N/A	50,000	-
Pfizer Ireland Pharma. Ultd	Cancelled	-	100	0	N/A	84,000	-
Eli Lilly S.A.	Proceeding	3.40	224	41	140	66,964	N/A (proceeding)
Smithkline Beecham Ltd	Completed partly	-	136	-121	N/A	15,000	-
Teva Pharma. Industries Ltd (Ivax International BV)	Completed fully	-	165	-115	N/A	30,303	-
Glaxosmithkline Dungarvan Ltd	Completed fully	-	135	61	N/A	10,000	-

Table 29: Basic Data of Internal Business Services Case Study in Poland

Beneficiary	Type of investment	Region	Procedure	Total eligible sum nominal in € million	Instrument	Aid amount granted in € million nominal value	Targeted area Art. 107 (3) (a)/(c)	Max GGE permitted at regional level	Max GGE/NGE permitted in specific cases	GGE granted
Carlsberg Accounting Service Centre Sp. z o.o.	New establishment	Wielkopolskie	N 578/2007	9.25	Direct grant	0.26	a	40%	40%	2.81%
Reuters EUROPE S.A.	New establishment	Pomorskie	N 721/2007	6.79	Direct grant	0.30	a	40%	40%	4.37%
MAN Accounting Centre Sp. z o.o.	New establishment	Wielkopolskie	N 743/2007	8.40	Direct grant	0.27	a	40%	40%	4.27%
KPIT Infosystems Central EUROPE Sp. z o.o.	New establishment	Dolnośląskie	N 51/2008	13.88	Direct grant	0.329	a	40%	40%	2.37%
State Street Services (Poland) Limited Sp z o.o.	New establishment	Małopolska	N 360/2008	12.50	Direct grant	0.58	a	50%	50%	7.13%
UPS Polska Sp. z o.o.	New establishment	Dolnośląskie	N 433/2008	7.99	Direct grant	0.22	a	50%	50%	2.82%
Unicredit Processes and Administration SA	New establishment	Zachodniopomorskie	N 338/2009	8.14	Direct grant	0.30	a	40%	40%	7.32%
Citibank International Plc Oddzial z Polsce	Extension, Diversification	Mazowieckie, Łódź, Warmińsko-Mazurskie	N 433/2010	12.68	Direct grant	0.36	a	30%/40%, 50%, 50%	lowest: 30%	2.84%

Table 30: Impacts of Investments in Poland

Beneficiary	Status	Aid amount paid in € million	Number of new direct jobs during operating phase				
			Planned	Achieved *(Granting Authorities Dec. '10)*	Achieved *(Beneficiary June '12)*	Aid / Job in € *(planned)*	Aid / Job in € *(achieved)*
Carlsberg Accounting Service Centre Sp. z o.o.	Proceeding	0.19	280	218	285	928	661
Reuters EUROPE S.A.	Achieved	0.30	300	467	950	1.015	320
MAN Accounting Centre Sp. z o.o.	Achieved	0.27	271	275	302	1.000	897
KPIT Infosystems Central EUROPE Sp. z o.o.	Terminated	-	500	0	N/A	658	-
State Street Services (Poland) Limited Sp z o.o.	Achieved	0.58	334	336	334	1,728	1,728
UPS Polska Sp. z o.o.	Achieved	0.22	316	366	N/A	711	614
Unicredit Processes and Administration SA	Achieved	0.30	340	340	340	868	868
Citibank International Plc Oddzial z zolsce	Proceeding	0.21	350	200	N/A	1,035	1,026

Table 31: Basic Data of Automotive Industry Case Studies in Hungary and Slovakia

Beneficiary	Type of investment	Region	Procedure	Total eligible sum nominal in € million	Instrument	Aid amount granted in € million nominal value	targeted area Art. 107 (3) (a) / (c)	GGE / NGE	Max GGE permitted at regional level	Max GGE / NGE permitted in specific cases	GGE granted
Getrag Ford Transmissions	New establishment	Košice	N 158/2005	265.00	Direct grant, Tax relief	53.50	a	NGE	50%	26.02%	18.40%
Mercedes-Benz	New establishment	Dél-Alföld	N 671/2008	688.00	Cash grant, Tax relief, Infrastructural aid, Compensation for exchange rate fluctuations	170.00	a	GGE	50%	20.74%	20.34%
Volkswagen	Diversification	Bratislavský kraj	N 674/2008	300.00	Tax relief	14.30	c	GGE	10%	4.92%	4.67%

Table 32: Impacts of Investments in Hungary and Slovakia

Beneficiary	Status	Aid amount paid in € million	Number of new direct jobs during operating phase			
			Planned	Achieved (*Beneficiary June '12*)	Aid / Job in € *(planned)*	Aid / Job in € *(achieved)*
Getrag Ford Transmissions	Completed	53.50	750	1,200	71,333	44,583
Mercedes-Benz	Proceeding	170.00	2,500	n/a	68,000	N/A (proceeding)
Volkswagen	Completed	14.30	N/A	n/a	n/a	n/a

Table 33: Basic Data of Pulp and Paper Industry Case Studies in Spain and Portugal

Beneficiary	Type of investment	Region	Procedure	Total eligible sum nominal in € million	Instrument	Aid amount granted in € million nominal value	targeted area Art. 107 (3) (a)/(c)	GGE/NGE	Max GGE permitted at regional level	Max GGE/NGE permitted in specific cases	GGE granted
Papelera Guipuzcoana de Zikuñaga	Extension (Change in production process)	El País Vasco	N 88/2002	64.80	n/a	4.24	c	NGE	20%	17.70%	4.83%
Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	Change in production process	El Burgo del Ebro	NN 81/2004	161.88	Direct grant	12.80	c	NGE	20%	11.87%	7.91%
PORTUCEL - About the Future - Empresa produtora de Papel	New establishment (Change in production process)	Península de Setúbal	N 564/2006	543	Tax relief	52.43	c	NGE	20%	8.31%	6.99%
Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	Extension (Change in production process)	Centro – Baixo Mondego	N 900/2006	319 (discounted)	Tax credit, soft loan	89.93	a	NGE	43%	20.15%	18.60%
Papeles y Cartones de €opa S.A (€OPAC)	Change in production process	Castilla y León	MF 57/2007	74.11	Direct grant	13.47	c	GGE	n/a	n/a	18.00%

Table 34: Impacts of Investments in Spain and Portugal

Beneficiary	Status	Aid amount paid in € million	Number of new direct jobs during operating phase			
			Planned	Achieved (*Beneficiary June '12*)	Aid / Job in € *(planned)*	Aid / Job in € *(achieved)*
Papelera Guipuzcoana de Zikuñaga	Completed	4.24	25	n/a	169,600	n/a
Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	Completed	12.80	110	54	116,364	237,037
PORTUCEL - About the Future - Empresa produtora de Papel	Completed	52.43	180	n/a	291,278	n/a
Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	Completed	89.93	N/A	5	n/a	17,986,000
Papeles y Cartones de €opa S.A (€OPAC)	Completed	13.47	N/A	15	n/a	1,496,667

Table 35: Basic Data of Solar Industry Case Studies in Germany

Beneficiary	Type of investment	Region	Procedure	Total eligible sum nominal in € million	Instrument	Aid amount granted in € million nominal value	targeted area Art. 107 (3) (a)/(c)	GGE/NGE	Max GGE permitted at regional level	Max GGE/NGE permitted in specific cases	GGE granted
Ersol Solar Energy AG	Extension	Thuringia	N 539/2008	525.52	Investment premium	55.1	a	GGE	30%	10.20%	10.20%
Masdar PV GmbH	New establishment	Ilm-Kreis/Thuringia	N 545/2008	143.50	Tax relief, Direct grant	28.62	a	GGE	30%	19.29%	19.29%
Wacker Chemie AG	Diversification	Saxony	N 221/2009	800.00	Investment premium, Direct grant	97.5	a	GGE	30%	12.31%	11.72%

Table 36: Impacts of Investments in Germany

Beneficiary	Status	Aid amount paid in € million	Number of new direct jobs during operating phase			
			Planned	Achieved (*Beneficiary June '12*)	Aid/Job in € *(planned)*	Aid/Job in € *(achieved)*
Ersol Solar Energy AG	Proceeding	55.10	689	1000	79,971	55,100
Masdar PV GmbH	Completed	28.62	500	200	57,240	143,100
Wacker Chemie AG	Proceeding	97.5	N/A	500	n/a	195,000

Table 37: Basic Data of Cement Industry Case Studies in Hungary

Beneficiary	Type of investment	Region	Procedure	Total eligible sum nominal in € million	Instrument	Aid amount granted in € million nominal value	targeted area Art. 107 (3) (a)/(c)	GGE/NGE	Max GGE permitted at regional level	Max GGE/NGE permitted in specific cases	GGE granted
Holcim	n/a	Közép	MF13/2006	n/a	Tax credit	37.5	a	NGE	n/a	n/a	22.52%
Nostra Cement Ltd.	New establishment	Dél	MF 8/2008	167.00	Tax relief	12.56	a	GGE	50%	29.30%	7.54%

Table 38: Impacts of Investments in Hungary

Beneficiary	Status	Aid amount paid in € million	Number of new direct jobs during operating phase			
			Planned	Achieved (*Beneficiary June '12*)	Aid/Job in € *(planned)*	Aid/Job in € *(achieved)*
Holcim	Cancelled	n/a	n/a	n/a	n/a	n/a
Nostra Cement Ltd.	Completed	12.56	n/a	130	n/a	96.615

APPENDIX 3
RESULTS OF SURVEY TO BENEFICIARIES

Table 39: Investment Phase

Case study	Name of company	1. According to our files your investment volume amounted to «Investment Volume». If this is not correct please provide us with a corrected figure:	2. Out of the above mentioned total investment volume, how much did you approximately spend for the following items but only for suppliers located in a 50 km-radius around the site of your investment? Please estimate (%)			
			Construction	Goods/equipment	Services	Other
Pharmaceutical	Eli Lilly S.A.	correct (€400 m)	18%	3%	17%	do not know/not specified
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	correct (€9.25 m)	do not know/not specified	do not know/not specified	do not know/not specified	do not know/not specified
Internal business services	Reuters EUROPE S.A.	correct (€6.79 m)	do not know/not specified	do not know/not specified	do not know/not specified	do not know/not specified
Internal business services	MAN Accounting Centre Sp. z o.o.	correct (€8.40 m)	10%	70%	10%	10%
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	correct (ROBK ?)	do not know/not specified	do not know/not specified	do not know/not specified	do not know/not specified
Internal business services	UniCredit Processes and Administration SA	incorrect (€7.19 m)		6,20%	53% (rental premises + utilities)	
Car industry	Getrag Ford Transmissions	correct (€265 m)	do not know/not specified	"small proportion"	do not know/not specified	0.50%
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	correct (€161.88 m)	13,00%	3%	2%	
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	correct (€319 m)	16%	0%	1%	
Paper/pulp industry	Papeles y Cartones de €opa S.A (€OPAC)	correct (€74.11 m)	1%	15%		
Solar industry	Bosch Solar Energy (former Solar Energy AG)	correct (€525.52 m)	1%	3.5%	2%	1%
Solar industry	Masdar PV GmbH	correct (€143.5 m)	22%	62%	0.70%	0.70%
Solar industry	Wacker Chemie AG	correct (€800 m)	12%	2%	4%	0%
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	correct (€167 m)	do not know/not specified	do not know/not specified	do not know/not specified	do not know/not specified

Table 40: Operating Phase Turnover

Case study	Name of company	4. We assume the investment will generate additional turnover. How much additional turnover do you expect annually when the full production capacity of your investment project is achieved? Please estimate. – €M	5. In case you cannot provide the figure above: According to our files the state aid for your investment amounted to «Investment volume». Could you indicate the extent of the aid in relation to the annual turnover generated by the project?
Pharmaceutical	Eli Lilly S.A.	>1 billion €(seeking to exceed investment sum)	
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	Center saves €9 M/annually in comparison to before the investment	
Internal business services	Reuters EUROPE S.A.	Annual costs of running the centre: USD 39 m	
Internal business services	MAN Accounting Centre Sp. z o.o.	€7.1 M	
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	Do not know/not specified	
Internal business services	UniCredit Processes and Administration SA	€1.3 M	10% to 25%
Car industry	Getrag Ford Transmissions	€400 M	do not know / not specified
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	€185 M	
Paper/pulp industry	PORTUCEL - About the Future - Empresa produtora de Papel		
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	€200 M	
Paper/pulp industry	Papeles y Cartones de €opa S.A (€OPAC)	€25-30 M	
Solar industry	Bosch Solar Energy (former Solar Energy AG)	Do not know/not specified	
Solar industry	Masdar PV GmbH	Do not know/not specified (investment might not generate turnover at all)	
Solar industry	Wacker Chemie AG	>€300 M	
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	€25 M	

Table 41: Operating Phase Jobs

Case study	Name of company	6. How many direct jobs have been / will be created by your investment (full time equivalents)?	7. Of the aforementioned direct jobs, approximately how many employees live within a 50 km-radius of your site?	8. For the aforementioned direct jobs, approximately how much do you intend to spend for training of those employees annually? - m€
Pharmaceutical	Eli Lilly S.A.	140 (expected to be 250+)	more than 80%	€0.5 M (up front € 4-5 M were spent on training to make labour force operational), 2/3 of employees have a third-level education, other 1/3 received around 8 weeks of special training before being able to operate the facilities)
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	285	more than 80%	€0.25 M
Internal business services	Reuters EUROPE S.A.	950 (target 300, overachieved goal within first year)	more than 80%	€0.20 M
Internal business services	MAN Accounting Centre Sp. z o.o.	302	more than 80%	€0.13 M
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	334	more than 80%	do not know / not specified
Internal business services	UniCredit Processes and Administration SA	340	more than 80%	€0.2 M
Car industry	Getrag Ford Transmissions	1200	more than 80%	€0.5 M
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	54	more than 80%	€ 0.1 M
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	5	more than 80%	do not know / not specified
Paper/pulp industry	Papeles y Cartones de €opa S.A (€OPAC)	15	more than 80%	€ 0.1 M
Solar industry	Bosch Solar Energy (former Solar Energy AG)	1000	more than 80%	do not know / not specified
Solar industry	Masdar PV GmbH	200	more than 80%	€0.1 M
Solar industry	Wacker Chemie AG	500	more than 80%	€0.2 M
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	130	more than 80%	€0.1 M

Table 42: Operating Phase Training

Case study	Name of company	6. How many direct jobs have been / will be created by your investment (full time equivalents)?	8. For the aforementioned direct jobs, approximately how much do you intend to spend for training of those employees annually? – €M
Pharmaceutical	Eli Lilly S.A.	140	0.5
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	285	0.25
Internal business services	Reuters Europe S.A.	950	0.2
Internal business services	MAN Accounting Centre Sp. z o.o.	302	0.13
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	334	
Internal business services	UniCredit Processes and Administration SA	340	0.2
Car industry	Getrag Ford Transmissions	1200	0.5
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	54	0.1
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	5	
Paper/pulp industry	Papeles y Cartones de Europa S.A (EUROPAC)	15	0.1
Solar industry	Bosch Solar Energy (former Solar Energy AG)	1000	
Solar industry	Masdar PV GmbH	200	0.1
Solar industry	Wacker Chemie AG	500	0.2
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	130	0.1

Table 43: Operating Phase R&D

Case study	Name of company	10. Does your investment include R&D (research and development) activities?	11. If yes: How much do you intend to spend for R&D (research and development) annually in connection with the investment? – €M
Pharmaceutical	Eli Lilly S.A.	Yes (investment is R&D site)	€55-60 M annual budget for facility (incl. Depreciations)
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	No	
Internal business services	Reuters Europe S.A.	Yes	do not know/not specified
Internal business services	MAN Accounting Centre Sp. z o.o.	No	
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	No	
Internal business services	UniCredit Processes and Administration SA	No	
Car industry	Getrag Ford Transmissions	No	
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	Yes	€0.1 M
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	No	
Paper/pulp industry	Papeles y Cartones de Europa S.A (EUROPAC)	Yes	€1 M
Solar industry	Bosch Solar Energy (former Solar Energy AG)	Yes	>€10 M
Solar industry	Masdar PV GmbH	Yes	€2 M
Solar industry	Wacker Chemie AG	Yes	€4 M
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	No	

Table 44: Operating Phase Suppliers

Case study	Name of Company	13. How many indirect jobs do you assume have been created by your investment in a 50 km-radius around the site of your investment? Please estimate. - Number of indirect jobs:	14. In relation to the turnover generated by the investment project, how much do you approximately spend for the following items but only for suppliers located in a 50 km-radius around the site of your investment? Please estimate			15. Are your suppliers located in a 50 km-radius around the site of your investment mainly new or existing suppliers?[324]	16. Did your investment induce investments from your suppliers in a 50 km-radius around the site of your investment?	17. Please provide some information about your supplier's investment. Description of the investment project, size of the investment, location, timing, etc."	18. Any additional comments on the benefits of your investment for your suppliers in the region?
			Goods/equipment	Services	Other supplies				
Pharmaceutical	Eli Lilly S.A.	200+/-	6%	8%	0%	new and existing suppliers to the same extent	do not know/not specified		Investment helped facilitate a pathway for others and leveraged into broader Cork area; other companies are emulating new technologies and invest in broadening their knowledge on the specific construction works and engineering skills
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	50				only new suppliers	do not know/not specified		Company spends around €8 M/year for salaries etc. - NOT SUPPLIERS (ADDITIOONAL INFO ONLY)
Internal business services	Reuters Europe S.A.	50	€29.7 M salaries, taxes, benefits	do not know/not specified	do not know/not specified	only new suppliers	yes	Bought equipment (car, cleaning, vacuum cleaners)	Reference for other investors, only one other investor, approached by local government, beforehand: small office Thomson Reuters.
Internal business services	MAN Accounting Centre Sp. z o.o.	10-20		26%		mostly existing suppliers	yes	IT service suppliers and recruiting agencies created jobs and invested in office space.	MAN's accounting centre was the first one to invest in the region. By that it established a cluster furthering knowledge transfer in the region. Suppliers can use accounting centre as reference.
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	do not know/not specified	do not know/not specified	do not know/not specified	do not know/not specified	new and existing suppliers to the same extent	yes		
Internal business services	UniCredit Processes and Administration SA	60	5%	50%	do not know/not specified	new and existing suppliers to the same extent	yes	Suppliers rented additional premises, invested in recruiting and training and bought office supplies.	Unicredit brought new opportunities and chances, is one the biggest employers in three region. Additional remark: Rental premises have not significantly risen in price.

[324] "New suppliers" means they became suppliers in the context of your investment project while "existing suppliers" are suppliers you dealt with already before the investment.

Case study	Name of Company	13. How many indirect jobs do you assume have been created by your investment in a 50 km-radius around the site of your investment? Please estimate. - Number of indirect jobs:	14. In relation to the turnover generated by the investment project, how much do you approximately spend for the following items but only for suppliers located in a 50 km-radius around the site of your investment? Please estimate			15. Are your suppliers located in a 50 km-radius around the site of your investment mainly new or existing suppliers?[324]	16. Did your investment induce investments from your suppliers in a 50 km-radius around the site of your investment?	17. Please provide some information about your supplier's investment. Description of the investment project, size of the investment, location, timing, etc."	18. Any additional comments on the benefits of your investment for your suppliers in the region?
			Goods/equipment	Services	Other supplies				
Car industry	Getrag Ford Transmissions	500	0%	3,75% (€15 M)	do not know/not specified	only new suppliers	do not know/not specified		A lot of money had to be invested in trainings for suppliers. It was a great challenge to help them adopt to the requirement of successfully competing internationally (there were "cultural differences"). Trainings were carried out intensively over last 3-4 years. Before reaching the workable status-quo of today, many deliverables had to be bought externally (cf. also: decreasing number of expatriates)
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	160	21%	13%	1,50%	mostly existing suppliers	yes	"Metsä Mill Services" established a maintenance centre with 177 employees in close proximity to the three plants of Saica.	Region is considered an important location for domestic market. Additionally, water and logistics are available and the know-how has grown over the past decades making the region very attractive for other companies as well. The investment was demand-driven and is extremely well situated between large cities. The negative aspect of the investment is the fact that it lead to an even higher concentration of plants in only one region (50% of European production is located in the region). In the future geographical diversification will be considered and carried out.
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	500	do not know/not specified	do not know/not specified	do not know/not specified	mostly existing suppliers	yes	Suppliers bought more trucks, invested in machinery, built workshops	Visibility of suppliers increased, local suppliers are now able to establish contacts with bigger suppliers from Scandinavia (Metso, Siemens) in other locations ->sub-suppliers.
Paper/pulp industry	Papeles y Cartones de Europa S.A (EUROPAC)	50	25%	5%	1%	only existing suppliers	do not know/not specified		Suppliers are mainly from waste paper business and have evolved positively. So-called 'maintenante' suppliers who take care of electricity and equipment make up for around 20% of suppliers in the region.

Case study	Name of Company	13. How many indirect jobs do you assume have been created by your investment in a 50 km-radius around the site of your investment? Please estimate. - Number of indirect jobs:	14. In relation to the turnover generated by the investment project, how much do you approximately spend for the following items but only for suppliers located in a 50 km-radius around the site of your investment? Please estimate			15. Are your suppliers located in a 50 km-radius around the site of your investment mainly new or existing suppliers?[324]	16. Did your investment induce investments from your suppliers in a 50 km-radius around the site of your investment?	17. Please provide some information about your supplier's investment. Description of the investment project, size of the investment, location, timing, etc."	18. Any additional comments on the benefits of your investment for your suppliers in the region?
			Goods/equipment	Services	Other supplies				
Solar industry	Bosch Solar Energy (former Solar Energy AG)	at least 20	do not know/not specified	do not know/not specified	do not know/not specified	only new suppliers	yes	Company 'CRS Reprocessing' invested and hired 20 workers	
Solar industry	Masdar PV GmbH	20		15-20%	25-30% incl. Electricity and gas	only new suppliers	yes	Because of Masdar's and other investments, applied materials located its headquarter in the region. Masdar joined an existing, strong network (did not pioneer with its investment)	
Solar industry	Wacker Chemie AG	800	5%	10%	0%	mostly existing suppliers	yes	Construction of new facilities for pipe-cleaning-company, additionally employed workforce	Quality of service suppliers is continuously high, they are able to deal well with the additional capacity of Wacker's production site.
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	300 (about 50% in the region)	raw materials and energy (main items!) are supplied from a 150km radius		do not know/not specified	only new suppliers	yes	Maintenance and transport suppliers invested in serving extra demand.	Region is currently at an unemployment rate of 20% - Thus, they welcome any employer, even if it is industrial facilities only.

Table 45: Operating Phase Clients

Case study	Name of company	19. In relation to the turnover generated by the investment project, how much do you approximately achieve with clients located in a 50 km-radius around the site of your investment? - % of turnover	20. Are your clients located in a 50 km-radius around the site of your investment mainly new or existing clients? "New clients" means they became clients in context of your investment project while "existing clients" are clients you dealt with already before the investment.	21. Did your investment induce investments from your clients in a 50 km-radius around the site of your investment?	22. Please provide some information about your clients' investments.	23. Any additional comments on the benefits of your investment for your clients in the region?
Pharmaceutical	Eli Lilly S.A.	0%				
Internal business services	Carlsberg Accounting Service Centre Sp. z o.o.	0%				
Internal business services	Reuters Europe S.A.	0%				
Internal business services	MAN Accounting Centre Sp. z o.o.	14%	only existing clients	no		Existing client in the region is shifting more and more activities to the centre and is becoming an ever larger client.
Internal business services	State Street Services (Poland) Ltd. Sp z o.o.	0%				
Internal business services	UniCredit Processes and Administration SA	0%				
Car industry	Getrag Ford Transmissions	0%	do not know/not specified	do not know/not specified		Keine Kunden in der Region, sondern in DE, BEL, USA und JP.
Paper/pulp industry	Sociedad Anónima Industrias Celulosa Aragonesa (SAICA)	18%	only existing clients	no		
Paper/pulp industry	Celulose Beira Industrial (Celbi) – Empresa Produtora de Papel	0%	do not know/not specified	do not know/not specified		
Paper/pulp industry	Papeles y Cartones de Europa S.A (EUROPAC)	5%	only existing clients	do not know/not specified		Relatinship to clients in the region is very strong because the paper mill/packaging plant is producing items fit to their demands. This means that the

Case study	Name of company	19. In relation to the turnover generated by the investment project, how much do you approximately achieve with clients located in a 50 km-radius around the site of your investment? - % of turnover	20. Are your clients located in a 50 km-radius around the site of your investment mainly new or existing clients? "New clients" means they became clients in context of your investment project while "existing clients" are clients you dealt with already before the investment.	21. Did your investment induce investments from your clients in a 50 km-radius around the site of your investment?	22. Please provide some information about your clients' investments.	23. Any additional comments on the benefits of your investment for your clients in the region?
						presence of the clients in the region is a main driver for investment rather than the other way around.
Solar industry	Bosch Solar Energy (former Solar Energy AG)	0%				There are almost no clients in the region
Solar industry	Masdar PV GmbH	10%	only new clients	yes	Masdar built a solar park for presentational purposes. This attracted one large investment with a total investment sum of €25m. However, follow-up or similar projects with similar dimensions are not likely to follow in the next years. Turnover with clients in 50 km radius is around 10% (in 2011 it was 50% because of the large investment project)	With the presentational facilities and the large client in the region, Masdar is able to demonstrate to what extent the solar energy is a workable option in the region. This allows for client attraction.
Solar industry	Wacker Chemie AG	0%				
Cement industry	Nostra Cement Ltd. (Lafarge Strabag Joint Venture)	0,20%	only new clients	yes	Cement plants produce the basis of any building. However, the additional capacity did not influence the demand. Hungary's economy is in a serious recession. Yet, a cement plant is a very long-term investment. It cannot be judged whether the investment was a success or not after these few years of operation.	

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