THE ECONOMIC RETURN OF COHESION EXPENDITURE FOR MEMBER STATES

STUDY

2009
The Economic Return of Cohesion Expenditure for Member States

Abstract

This study provides an analysis of the economic returns of structural and cohesion policy expenditure (ERDF and Cohesion Fund) to net contributors to the EU budget, (“donor” member states). The analysis shows that the economic benefits for the recipient countries are positive both during the implementation phase and in the long-run. Although the donor member states gain from expanded trade, this is not sufficient in all cases fully to compensate them for the negative economic effects that arise from the extra cost to finance the cohesion expenditure programmes in the recipient states by means of higher taxes in the donor states. However, negative impacts, where they arise, are small.
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<tbody>
<tr>
<td>APS</td>
<td>Aid to the Productive Sector</td>
</tr>
<tr>
<td>AT</td>
<td>Austria</td>
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<td>BE</td>
<td>Belgium</td>
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<td>BG</td>
<td>Bulgaria</td>
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<td>CAP</td>
<td>Common Agricultural Policy</td>
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<td>CF</td>
<td>Cohesion Funds</td>
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<tr>
<td>COMECON</td>
<td>Council for Mutual Economic Assistance</td>
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<tr>
<td>CSF</td>
<td>Common Support Framework</td>
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<tr>
<td>CY</td>
<td>Cyprus</td>
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<tr>
<td>CZ</td>
<td>Czech Republic</td>
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<td>DE</td>
<td>Deutschland</td>
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<tr>
<td>DG</td>
<td>Department General</td>
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<tr>
<td>DG-ECFIN</td>
<td>Directorate General Economic and Financial Affairs</td>
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<tr>
<td>DK</td>
<td>Denmark</td>
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<tr>
<td>EAGGF</td>
<td>European Agricultural Guidance and Guarantee Fund</td>
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<tr>
<td>EC</td>
<td>European Community</td>
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<tr>
<td>EDS.</td>
<td>Editors</td>
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<td>EE</td>
<td>Estonia</td>
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<td>EL</td>
<td>Greece</td>
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<td>ERDF</td>
<td>European Regional Development Fund</td>
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<td>ES</td>
<td>Espana</td>
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<td>ESF</td>
<td>European Social Fund</td>
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EU European Union
FAS Foras Aiseanna Saothair, Irish Training and Employment Agency
FI Finland
FIFG Financial Instrument for Fisheries Guidance
FR France
GDP Gross Domestic Product
GNP Gross National Product
HU Hungary
IE Ireland
IT Italy
LU Luxembourg
LV Latvia
Mill. Million
MT Malta
NDP National Development Programme
NL Netherlands
NSRF National Strategic Reference Framework
OMS Older Member States
OP Operation Programme
PL Poland
PT Portugal
R&D Research & Development
RO Romania
SE Sweden
**SI**  Slovenia

**SK**  Slovakia

**SOE**  Small Open Economies

**SPD**  Single Programme Document

**UK**  United Kingdom
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EXECUTIVE SUMMARY

Background

In this report we analyse the manner in which the EU cohesion expenditure activities that were implemented during the budget programming period 2000-2006 are likely to have affected donor member states. The group of countries that we refer to as “donor” states are the eleven member states that have made net contributions to the EU budget (i.e., net in the sense that they are adjusted for receipts under the Common Agriculture Policy). In descending order of the size of their net contribution measured in euro, these are: Germany, France, the Netherlands, Italy, Great Britain, Sweden, Belgium, Austria, Denmark, Luxemburg and Finland.

The group of countries that we refer to as “recipient” states are all those designated as Objective 1 during the programming period 2000-2006, and include fourteen states in total: Cyprus, the Czech Republic, Estonia, Greece, Spain, Hungary, Ireland, Lithuania, Latvia, Malta, Poland, Portugal, Slovenia and Slovakia.

Our analysis of how the donor states are likely to be affected by cohesion expenditure was required to address six major themes (or questions), designated as follows:

Theme 1: How much of economic growth in donor states can be attributed to cohesion expenditure interventions in recipient states?

Theme 2: How do cohesion expenditure interventions influence the economic aggregates and the structure of the recipient economies? In particular, what part of the cohesion expenditure grants will be transformed into demand and production?

Theme 3: How big a share of cohesion expenditure interventions will leak to more prosperous regions via increased demand for imports from these regions? How are imports from donor states likely to evolve compared with the situation without structural funding?

Theme 4: What is the percentage of contractors from donor member states that have been awarded major public procurement contracts funded partly by cohesion expenditure?

Theme 5: How many jobs in donor member states depend upon cohesion expenditure financial transfers?

Theme 6: What is the effect of cohesion expenditure transfers upon cash flows?

Our report addresses these themes in a different order to that set out above because we need to sequence our research in a way that reflects the manner in which the underlying economic processes actually operate. Thus, in the first step of our analysis we start with the actual data on the budget contributions made by the donor states, and how an element of the total EU budget is devoted to supporting investment and other economic activities in the recipient states by means of cohesion expenditure. These facts will be well known to Members of the European Parliament, but are summarised since the data serves as quantitative inputs into subsequent analysis.
In our next step, we need to examine how cohesion expenditure programmes are implemented in the recipient states, and how they are likely to affect the economic performance of these states. In particular, we need to identify the spillover effects that create potentially beneficial impacts on the economies of the donor states. This stage of our research is designed to address Themes 2 and 3 above, i.e., the matters pertaining to the impacts on the recipient states.

Only when we have examined the direct impacts on the recipient states can we proceed to study the donor states, and trace through the spillovers from the recipients to the donors. At the very start of the process, the donor states have to bear the burden of making a net contribution to the EU budget. Any subsequent spillovers arising from the implementation of the cohesion expenditure programmes may offset some of the negative cost to donors of financing the budget. The overall net impact on the donors could, potentially, be either negative or positive. This stage of our research is designed to address Themes 1, 5 and 6 above, i.e., matters pertaining to the donor state impacts.

Finally, we are left with Theme 4, which is of different character to the other five macro themes. Our research uses two distinct levels of analysis methodology. At the macroeconomic level, the analysis relates to aggregate benefits obtained by the recipient and donor states, measured in terms of impacts on macroeconomic variables such as GDP, employment, etc. This embraces Themes 1-3, plus Themes 5-6. At the microeconomic level, the analysis relates to benefits obtained by individual firms within donor states arising from the implementation of selected types of interventions and projects within cohesion expenditure programmes. This calls for the identification of firms and consortia from donor states who were awarded major public procurement contracts funded partly by the cohesion expenditure programmes.

A final point needs to be made, before we present a summary of our main findings. This concerns the modelling methodology that we have used to address the five “macro” themes. Models are required for the analysis because it is impossible to explain the impacts of cohesion expenditure policies merely from observing the outcome in terms of growth of GDP, numbers employed, etc. For the years 2000-2008, we effectively know what the level and growth rate of GDP was in all the recipient and donor states. But we have no way of knowing what portion of growth performance was caused by cohesion expenditure programmes. Many other external and internal factors were also changing during the period 2000-2008, and will continue to change in the future, and we cannot identify the specific role of cohesion expenditure merely by looking at raw data. For this task, we have to use formal models of the economies of the recipient and donor states. The model framework that we adopt is HERMIN, which has been used in the area of cohesion analysis since the late 1980s. The reader is referred to Chapter 3 of our report, where we explain our modelling methodology in detail, the short account given in Annex 1, and to the relevant references to academic and other publications contained in the bibliography.

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1 Official national accounting data are available up to the year 2007 for all states, from national and EUROSTAT sources. Good estimates of many indicators of economic performance during 2008 are also available.

2 See Bradley, 2006 for a review of past use of HERMIN for analysis of cohesion expenditure impacts. Bradley and Untiedt, 2008 provides a complete User Manual of the HERMIN system of models of the recipient states. The models of the donor states are new, and details are available on request (Bradley and Untiedt, 2009).
The Economic Return of Cohesion Expenditure

The funding support

The net budget contributions made by the donor states vary in size. Rather than looking at the absolute amounts expressed in euro, it is more useful to look at the donor contributions expressed as a percentage of donor GNP. It is also useful to look at the receipts under cohesion programmes in terms of their size as a percentage of the GNP of the recipient states. A comparison between the net donor states and the net recipient states points to an asymmetry when the shares (received or paid) are expressed as a percentage of national GNP. The shares for the net donor states tend to be of modest size, and range between a high of 0.7 per cent of GNP for Luxembourg in the year 2002, to a low of less than 0.1 per cent of GNP for Denmark in the year 2002. On average, they tend to be much less than about 0.5 per cent of GNP per year. In the cases of Denmark, Finland, Italy and the United Kingdom, these “donor” states are actually “recipient” states for selected years towards the start of the programming period.

The shares for the net recipient states are more significant than the donor shares in terms of their size relative to GNP, and can range up to 4 per cent per year. Main recipient states from the EU budget during the cohesion expenditure programme 2000-2006 were Spain, Greece, Portugal and Ireland. Since the EU enlargements of 2004 and 2007, all new member states are also net recipients. However, their shares of cohesion expenditure tended to be small in the early years after accession, and built up rapidly as the programmes and procedures got under way. Expressed in absolute terms, the cohesion expenditure for the EU-15 amounted to around €231 billion for the programming period 2000-2006. Net recipient countries of the EU budget have received just over 50 per cent of this total, the rest being devoted to net donor states within the EU-15. The ten new member states joining in 2004 received 21.3 billion euro for the programming period 2004–2006.

Although each cohesion expenditure programme is a complex plan consisting of hundreds of individual projects and measures, grouped under a small number of Operational Programmes, we need to reclassify these for analysis using the models into three main economic investment categories: public infrastructure; human resources; and aid to private enterprises. The average shares of each economic category during the 2000-2006 programme, across all of the recipient countries, were 48.5, 35.9 and 15.6 per cent of the total, respectively.

For the programming period 2007-2013, the cohesion expenditure budget has been enlarged to €341.1 billion, of which about three quarters is devoted to net recipient countries (expanded now to include Bulgaria and Romania).

Impacts on recipient states

The second step of our analysis requires us to use the data on cohesion expenditure in order to quantify the impact of the cohesion programmes on the recipient states for the period 2000-2006, identifying the effects of boosting output (GDP) and the effects on stimulating the demand for imports. These impacts need to be known before we can examine the subsequent spillovers on the donor states. In our analysis we make a clear distinction between the demand-side impacts of cohesion expenditure during programme implementation, and the longer-lasting supply-side impacts that continue after the programmes are terminated. While the programmes are being implemented, they boost output and employment, particularly in the large-scale
construction schemes that make up a high proportion of total cohesion expenditure in most recipient states.

On the basis of the model analysis, the large implementational impacts are due to the Keynesian multiplier effects of the expenditures. These demand-side impacts quickly revert to zero after the programmes are completed (i.e., after 2008 in the case of the 2000-2006 programming period). However, as the improved stocks of physical infrastructure, human capital and R&D build up gradually, the supply-side benefits begin to come through in terms of higher sectoral production and higher productivity.

In Chapter 4 we report on the impacts of cohesion expenditure in each of the fourteen recipient states. With respect to the question raised in Theme 2 (i.e., how does the supply-demand split work through the recipient states?), the HERMIN simulations showed that the enduring impacts, after the termination of the programmes, were higher output in manufacturing and market services as well as higher productivity. The infrastructural investment programmes are carried out by the building sector, but the sustained boost to activity in this sector quickly vanishes once the programmes terminate. The agriculture sector and the government sector remain largely unchanged, except for state-led training schemes and institutions associated with the ESF part of the programmes.

The impacts for all the recipient states were presented in Figure 7 in Chapter 4, which consists of fourteen sets of four graphs per country, displaying the following results:

- EC-funded cohesion expenditure (expressed as a per cent of GDP)
- Cohesion expenditure impacts on GDP (expressed as a percentage increase relative to no-expenditure baseline)
- Cohesion expenditure impacts on employment (expressed as a percentage increase relative to no-expenditure baseline)
- Cohesion expenditure impacts on net trade balance (expressed as a percentage of GDP, difference from no-expenditure baseline)

Taking Estonia as an illustrative example, Figure 7, Panel (a), shows that the injection of EC-funded cohesion expenditure into the Estonian economy was 0.57 per cent of GDP in the start-up year, 2004, and rose gradually to 1.11 per cent of GDP by the final years. Panel (b) gives the impact of the cohesion expenditure on GDP, based on the HERMIN model simulation. In the initial year, the impact was only 0.6 per cent, i.e., the level of GDP was increased by 0.65 per cent above the baseline (no-policy) case. As the programme was progressively implemented, the impact on GDP increased, and peaked at 2.58 per cent in the final year, 2008. At that stage all cohesion expenditure is assumed to cease (remember, we are analysing the 2000-2006 programme in isolation from any other). With the cessation of funding, there is a sudden reduction in the boost to the level of GDP. But, due to supply-side spillovers, there are enduring benefits to GDP, albeit of smaller size. By the year 2015, i.e., seven years after the 2000-2006 programme expenditures were terminated, the boost to the level of GDP is still about 0.77 per cent.

3 The demand-side implementation impacts of cohesion expenditure resembles the aims of recent efforts to stimulate economies caught in the global downturn. However, it is the longer term, supply-side impacts of cohesion programmes that is at the core of EU activity.
Panel (c) gives the impacts on total employment, and these are seen to follow the same profile as the impacts on GDP, but are about half the magnitude.

The best summary of how production in the recipient states will be affected by cohesion expenditure programmes is provided by the so-called “cumulative” multiplier. This is calculated for any specific year by accumulating all previous increases in GDP that were attributable to the cohesion expenditure, and dividing them by the magnitude of the accumulated cohesion expenditure (expressed as a share of GDP). During the programme implementation years, the boost to GDP is attributable to the cohesion expenditure injections. But after the programme terminates, on December 31st, 2008, there are continued supply-side benefits in terms of increased GDP, but no further injection of funds.

We display the cumulative multipliers in summary form for all fourteen recipient states, for the year 2020 in Figure 1 below. We can divide these results into three groups, based on a ranking by the size of the cumulative multipliers:

**High values (above 3.0):** IE (4.0), ES (3.3), CZ (3.3) and MT (3.1)

**Medium values (2.5 to 3.0):** SK (2.8), EL (2.8), EE (2.8), PT (2.6), PL (2.5)

**Low values (below 2.5):** LT (2.4), HU (2.4), SI (2.2), CY (2.2), LV (1.9)

**Figure 1: Cumulative multipliers for recipient states: 2020**
*(Cohesion expenditure programme 2000-2006)*

Based on common assumptions for the size of the spillover mechanisms, this suggests that some recipient states are more effective in translating the cohesion expenditures into increased output than others. Those states with the highest multipliers are the most effective. As the multiplier declines, less of the cohesion expenditure ends up as increased production, and appears either as a demand-side

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4 The year 2020 is the terminal year for the simulations. It permits us to capture the very long-tailed influences of cohesion expenditure.
stimulus during the implementation period that terminates after 2008, and as increased demand for imports. However, our analysis suggests that in all cases an injection of one per cent of GDP in the form of cohesion expenditure will generate a return of at least two per cent of GDP in the long run, mainly as a result of the supply-side spillovers into production and productivity.

A final point to make with respect to the quantification of cohesion expenditure impacts is that the appropriate magnitude of the crucial spillover parameters (i.e., the size of the beneficial spillovers associated with improved stocks of physical infrastructure, human capital and R&D) are not known with any degree of precision. Our selected values are representative of the average values found in the international literature that is seldom based on research carried out in the recipient states. There is no such research available yet in the new member states. Indeed, the HERMIN models are often among the first such models of some of the new member states that are suitable for use in deep, structural policy analysis and medium-term projections. As a result, we have to look at the sensitivity of our results to variations in the sizes of the parameters. Such analysis shows the obvious: namely, the higher the spillovers, the larger the supply-side impacts on the recipient states.

Turning to the question raised in Theme 3 (i.e., How does the boost to imports leak out to stimulate exports in the donor states?), the simulations carried out with the HERMIN models showed that in every case, the net trade balance deteriorated as the cohesion expenditure programmes were implemented. However, we stressed that this should not be interpreted as being the result of a consumer boost, induced by cohesion expenditure. Actual cohesion expenditure programmes involve investment projects that generate increased demands for producer capital goods (initially), and consumer goods, after the wages are spent by workers.

The HERMIN simulations pick up the deterioration in the recipient country trade balance during implementation, when the funds help pay for the imports, and the resulting completed investment activities leave a long-enduring benefit in terms of more, and higher quality, roads and more productive, trained labour. After the programmes are terminated, the net trade balance in the recipient economies moves back into a surplus, when compared to the “no-funding” case. It is important to stress that even in the post-programme period, most of the recipient economies will continue to run sizeable net trade deficits for some time to come. But the HERMIN simulations suggest that the improvements in the supply sides of manufacturing and market services are likely to sustain a higher rate of import demand from the larger, more developed donor states. In view of the rapid trade integration within the Single European Market, much of this future trade will be in producer goods, and intermediate products, and not just in final or consumer goods.

At present, this phenomenon shows up in the HERMIN simulations in the form of a sustained higher demand for donor country exports, since the recipient states have considerable trade exposure to the donor states. Of course, as the recipient states develop, they will also be able to compete more effectively with the donor states. The HERMIN simulations suggest that this looks like becoming a mildly “positive-sum game”, where donor states and recipient states continue to gain. And as convergence takes place, at least at the national level, the balance between “net” donors and “net beneficiaries” will become more even.
We can illustrate this process using Estonia again as an example. From Figure 7, Panel (d) for Estonia, we see that the trade balance deteriorated by almost 0.8 percentage points (where the trade balance is expressed as a percentage of GDP). This deterioration continued and increased, reaching 1.2 per cent of GDP by the year 2007, and remaining high at 1 per cent of GDP in 2008. Immediately after the termination of the 2000-2006 programme at the end of 2008, the trade balance deterioration caused by the cohesion expenditure vanishes, and the improved supply potential of the economy means that there is a modest improvement in the trade balance of about 0.4 per cent of GDP in the post programme period.

The impacts on the net trade balances were shown for all fourteen recipient states in the graphs contained in Figure 7 of Chapter 4. In every case the trade balance deteriorates during the implementation phase (2000-2008), as the actual investments are being put in place and the capital and other goods and services are being imported in cases where they are not produced locally. Of course, this increased demand for imports by the recipient states can be potentially satisfied by any country in the world, and not just by increased exports from the eleven donor states. How much actually comes from exports of donor states is determined by the existing trade exposure of the recipient states to the donor states, and this is summarised in Figure 2, reproduced from Chapter 3.

**Figure 2: Percentage of total exports of donor states going to recipient states (2007)**

![Graph showing percentage of total exports of donor states going to recipient states (2007)](image)

Consequently, those donor states which have a high trade exposure to the beneficiary states (Germany, France and Italy, in particular) will be the likely beneficiaries of the increased demand for imports emanating from the recipient states. Of course, trade is a two-way process. As the recipient state economies begin to benefit from the supply-side improvements associated with cohesion expenditure, they, in turn, are likely to export more to the donor states. Indeed, we showed in Chapter 3 that the donor states made up a much higher share of the export markets for the recipient states than the recipient states did for the donor states. Consequently, it is the net impact on recipient and donor state trade that matters. Our analysis showed that all the recipient states run trade deficits (relative to the no cohesion expenditure case) during programme
implementation, and that this switches to a net trade surplus (once again, relative to the no cohesion expenditure case).

We can summarise as follows. **It is mainly during the implementation period of the 2000-2006 programme that the cohesion expenditures serve to boost the demand for imports by the recipient states.** As the funds are absorbed, demand in the recipient economy outstrips supply, and this appears as a deterioration of the balance of trade. Demand tends to react immediately, which it takes some time for the supply-side enhancing processes to work through, as the economy restructures. The main element of this restructuring takes the form of increased capacity in manufacturing and market services, and higher productivity. The summary magnitudes for each recipient state were presented in Figure 7.

After the cohesion expenditures terminate at the end of 2008, the demand-side stimulus vanishes and only the longer-term supply side enhancement remains. These are the result of spillover benefits from the improved stocks of physical infrastructure, human resources and R&D that were funded during 2000-2008 by the flow of cohesion expenditures. Although these “stocks” depreciate slowly over time, their spillover benefits are long-lasting, if modest.

Our analysis refers to the impacts of the programming period 2000-2006, which continues to the end of 2008 under the so-called “n+2” rule. The current programming period 2007-2013 started up in January, 2007, and overlapped the last two (“n+2”) years of the previous programming period. Cohesion expenditures under this current programme usually take up where the previous projects left off. In Annex 2 of our report we present a summary of our analysis of the impacts of the two programming periods, 2000-2006 and 2007-2013, regarded essentially as a single cohesion expenditure programme that will run from 2000 to 2015. The pattern of impacts are very similar to those of the 2000-2006 programme. But the current programme is directed very specifically at the new member states, whose trade orientation towards donor states tends to be different from that of the old recipient states (Greece, Ireland, Portugal and Spain).

**Spillover impacts on donor states**

**With respect to Theme 1 What are the impacts on donor state GDP from cohesion expenditure spillovers?** we stress that any such impacts will be transitory, at best. We have shown that there is a medium-term impact on the level of activity of the recipient states (i.e., GDP, employment, productivity, etc.), but no long-term impact on the growth rate of the recipient states. Consequently, any spillovers from recipient states will also produce medium-term level rather than growth impacts on the donor states.

Our HERMIN-based simulations suggest that in the implementation years of the cohesion expenditure programmes, there are positive impacts of trade-boosting spillovers from recipient states to donor states. However, these are more than off-set by the negative impact on the donor economies of having to finance the budget contribution by raising taxes. In our simulations we financed the EU budget contribution in the donor states by raising a tax rate. We could also have reduced public expenditure in the donor state by just enough to fund the budget contribution. The negative economic impacts on the donor economy are broadly similar in both cases.
All the impacts on the donor states are presented in Chapter 5, Figure 14, where we can see exactly how GDP and employment in the donor states are affected. It is clear that some donor states benefit from the indirect spillovers more than others. For example, **France**, the **United Kingdom** and **Italy** suffered no significant negative growth or employment impacts over the 2000-2006 cohesion expenditure programme, either during implementation (when they had to make net budget contributions) or after implementation (when we assume that the budget contribution is terminated).

The **Netherlands** and **Luxembourg**, on the other hand, experienced negative impacts on GDP and employment during the period 2000 to 2008, when they are assumed to be making net contributions to the EU budget. This was due to a mixture of the size of the budget contribution, the structure of these two economies, and the trade orientation to the main recipient states in Eastern and Southern Europe. But even in the case of the Netherlands, where the negative impact on GDP was largest, the level of GDP was only reduced at most by about 0.8 of one percentage point. The other donor state impacts lie between the extremes of France, on the one hand, and the Netherlands on the other.

Turning to the question raised in Theme 5 **How many jobs in donor states depend on cohesion expenditure programmes?**, we stress in Chapter 5 that the question of job dependency in donor states and its association with cohesion expenditure programmes, has to be addressed with care. One must make the distinction between total employment numbers in the donor state economy, or in certain sectors of the economy, and specific employment in work that is associated with sectors which are involved in trade with the recipient states. Thus, even in the case of the Netherlands, where the overall impact on total employment was seen to be negative (see Figure 14, Panel (d)), there are still likely to be specific jobs that are dependent on the cohesion expenditure spillovers into the Netherlands. Nevertheless, the overall impact is negative. Even in the case of France, where the overall impact of the cohesion expenditure spillovers and the budget financing requirement on total numbers employed was positive, there are possibly some jobs that are threatened by trade with the recipient states, and some jobs that are negatively affected by the need to raise the rate of personal income tax in order to fund the EU budget contribution.

The results bearing on the final macro question raised in Theme 6 **What is the effect of cohesion expenditure transfers upon cash flows?** are interpreted in terms of three measures: the net trade balance; public sector financial balances; and profits in the corporate sector. The results of the impacts on all these measures are presented in Figure 20 in Chapter 5. Using Germany as a typical example, the impact of cohesion expenditures (i.e., the net impact of financing the budget contribution and the impact of trade spillovers from the recipient states) on the German net trade balance is uniformly positive, but it is only boosted by a maximum of 0.2 percent of GDP (in 2004). The impacts on the public finances are also small, and show that the government borrowing requirement, expressed as a percentage of GDP, increased slightly for the years 2000 to 2008, and fell slightly thereafter (both relative to the no-policy baseline). The biggest increase was recorded in the year 2003, but was only 0.1 percentage points. Finally, corporate profits fell slightly during 2000-2008, and improved thereafter. Given the small size of these effects, it is difficult to draw any firm and robust conclusions with respect to theme 6, other than to state that the impacts on cash flows are very minor, and probably well within any margin of error surrounding the
structure and operation of the HERMIN models. Similar conclusions apply to all the other ten donor states.

We conclude that in the cases of nine of the donor states (i.e., excluding France and the United Kingdom), the cost of supporting cohesion expenditure programmes in the recipient states represents a small burden in terms of loss of GDP and employment, a slightly higher public sector borrowing requirement and lower corporate profits during the implementation years 2000-2008, but a slightly improved balance of trade. In the exceptional cases of France and the United Kingdom, these impacts are mainly positive, even during the implementation period. In the post-implementation years, 2008 onwards, these impacts all turn positive, but are of small magnitude. So there are redistributional effects associated with the support of cohesion expenditure programmes. This process does lead to a modest transfer of resources from the donor states to the recipient states.

The micro impact question

Theme 4 asks the question: What share of major public procurement contracts were awarded to enterprises from donor states? To answer it requires access to data concerning on individual contractors and their country of origin. After extensive investigations at the level of the Commission, at the national and even at the regional level, in donor and recipient states, we finally had to conclude that that data on individual contractors are not recorded or published. One reason for lack of data is that the individual contractors are not regarded as beneficiaries of the EU cohesion expenditure, and that all contracts are awarded by many different levels of national and local administrations. Improvements in data collection in the current programming period, 2007-2013, have only partially addressed this lack of data. It proved impossible, within the time and budget constraints of the contract, to set up a separate survey to gather these data.

But even knowing the nationality of main contractors would give very little information on the likely financial benefits to that contractor or to the country of origin. Analysis of all the sub-contracting activities needs to be taken into account, where many of them are likely to come from the recipient state where the project is being implemented. This unsatisfactory situation needs to be addressed by more systematic data collection at the project level, both as part of project cost-benefit analysis, and to identify the firms who ultimately benefit from projects funded by cohesion expenditure.

Recommendations

Our recommendations relate to various stages of the analysis, starting with the general lack of assessment of the impacts of cohesion expenditure at the project or microeconomic level. Macro evaluations depend crucially on access to information concerning the detail of how the cohesion policy programmes are planned and implemented, and on knowledge of the quality of a range of representative projects from each of the three economic categories of investment. The danger is that poorly designed programmes, and inadequate project selection criteria will result in programme macro impacts that are largely confined to the implementation period, and have low (or no) longer term supply-side benefits. We strongly recommend that such analysis be made a formal
part of future programme application and implementation procedures, carried out along formalised guidelines set down by the Commission.

A closely related recommendation concerns the requirement to be able to identify the individual contractors that are selected to carry out major public procurement projects, mainly in the areas of physical infrastructure and major training schemes. Our failure to answer the question set out in Theme 4 was due to the total lack of any such data in the public domain. We recommend that the Managing Authorities in all the recipient states be required to document the main contractors selected to carry out any major public procurement project with their country of origin, and to require that these main contractors identify and declare the share of the project budget that is devoted to sub-contractors, whose national identity should also be recorded. Only in this way would we be able to begin to gauge how the benefits of the associated cohesion expenditure was actually distributed across donor and recipient member states for major public procurement projects. Taken together, the above two recommendations would greatly expand the knowledge base available to the Committee as it exercises oversight on cohesion expenditure programmes.

Our next recommendation relates to the manner in which the different cohesion expenditure programmes have been analysed in isolation from each other in the past. In our report, we were requested to carry out, essentially, an ex-post impact analysis of programme 2000-2006, whose implementation period covered the years 2000-2008. This is a very unsatisfactory and unscientific approach, driven by administrative requirements to account formally for allocated budgets in each separate programming period. In fact, the various rounds of cohesion expenditure are not isolated from each other in practice, but represent an unfolding sequence of closely inter-related investment projects, many of which span multiple programming periods. We recommend that all future impact studies, give close attention to the continuity between past and present cohesion expenditure programmes. An example of why this is important was the case where we examined the back-to-back consequences of the programming periods 2000-2006 and 2007-2013 in terms of spillover benefits for Germany. Taken in isolation, there were found to be negative impacts of programme 2000-2006 on Germany during the implementation years 2000-2008, and the impacts only turned positive in the post-implementation period. If we had analysed the impacts of the programme period 2007-2013 in isolation, a similar result would have been found. However, when we ran both programmes back-to-back, the impacts remained positive for Germany, even during the implementation phase of programme 2007-2013 (i.e., the years 2009-2015) when budget contributions were being made.

Finally, we make a wider recommendation based on the fact that the spillover impacts of cohesion expenditure on donor states are so small that there is a risk that such programmes might be regarded as unimportant for donor states. It would be more logical to study the impacts of cohesion expenditure within the wider context of the progressive deepening of the Single European Market and the prospects of the adoption of the euro by the new member states, probably during the current programming period. When one asks the question: “what are the impacts of the cohesion expenditures, in isolation from any other changes?”, the impacts turn out to be relatively small. But, isolated study of cohesion expenditure programmes runs the risk of missing the wider benefits that stem from boosting the competitive performance of the recipient states. In particular, it may lead to neglect of the opportunities that open up for closer, mutually beneficial links between recipient and donor states in the form of internationally mobile investment, specialist sub-supply, migration of workers with specific
expertise and experience, in addition to the more direct impacts in terms of increased import demand that we have examined in this report.
1. GENERAL INTRODUCTION TO THE AIMS OF THE STUDY

**KEY FINDINGS**

This chapter sets out the background context of the report in terms of the goals of EU cohesion policy, and describes how the main six themes are investigated.

- **Theme 1**: How much of economic growth in donor states can be attributed to cohesion expenditure interventions in the recipient states?

- **Theme 2**: How do cohesion expenditure interventions influence the economic aggregates and the structure of the beneficiary economies? In particular, what part of the cohesion expenditure grants will be transformed into demand and production?

- **Theme 3**: How big a share of cohesion expenditure interventions will leak to more prosperous regions via increased demand for imports from these regions? How are imports from donor states likely to evolve compared with the situation without structural funding.

- **Theme 4**: What is the percentage of contractors from donor member states that have been awarded major public procurement contracts funded partly by cohesion expenditure?

- **Theme 5**: How many jobs in donor member states depend upon cohesion expenditure financial transfers?

- **Theme 6**: What is the effect of cohesion expenditure transfers upon cash flows?

1.1. Introductory remarks

It has been more common to examine the impact of EU structural and cohesion policy expenditure (ERDF and Cohesion Fund) on the recipient states than on the “donor” member states (i.e., the net contributors to the EU budget). After all, the primary purpose of EU cohesion policies is to provide a boost to those EU member states whose economic performance lags behind the more advanced states. The objective of ensuring an equitable process of EU-wide development, where no member state is left behind, is a core value of the EU. This study was designed to examine an important and interesting secondary impact of cohesion expenditure, namely the spillover impact on the net donor states as they are affected by the consequences of the primary impact on the recipient states.

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5 In the rest of this report, for simplicity we will refer to "structural and cohesion policy expenditure (ERDF and Cohesion Fund)" as simply "cohesion expenditure". Consequently, when we use the term "cohesion policy", we include Structural Funds as well as Cohesion Funds. If we have to distinguish between Structural Funds and Cohesion Funds, we will do so explicitly.

6 The objective of strengthening economic and social cohesion is mentioned explicitly in Article 2 of the Treaty and is the first objective of the European Union (EU). More specifically, Article 158 states that cohesion is a precondition for harmonious development in the EU. This article goes on to stress that fostering cohesion requires that "the Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas."
In line with the EU cohesion policy objective, analysis is undertaken regularly by recipient states as well as by the Commission itself, and has always focused on the impacts of cohesion expenditure on the recipient national and regional economies in terms of enhanced growth performance and promotion of more rapid convergence. Until now, the possible existence of feedback benefits to the donor states has not usually been explored.

The object of the present study is to examine the possible existence, transmission mechanisms and magnitudes of beneficial spillover effects of cohesion expenditure from the recipient states back to the donor states, thus exploring ways in which the donor states might also benefit indirectly from the implementation of cohesion policy in the EU. We refer to the benefits to the donor states as “indirect”, since they arise as a spillover consequence of EU cohesion expenditure, and are not the “primary” target of that policy. The primary goal of EU cohesion policy has always been to boost the rate of development of lagging member states, and to ensure that they can also compete successfully within the Single European Market and eventually join the euro zone. However, the history and economic geography of the formation of the European Union resulted in relatively weak southern, eastern and western peripheries, and a centralised core of advanced states, many of whom were founding signatories of the Treaty of Rome in 1956.

This initial state of unequal development risked the weaker states diverging further from the longer-term cohesion objective. However, it also raised the possibility of an EU-wide growth process where complementarities could exist between states at different stages of development. Under certain circumstances, growth could become a co-operative, positive sum game, rather than a competitive, zero sum game. In other words, the more developed “donor” states could provide assistance to the less developed “recipient” states. Any negative impacts on the “donor” states arising from the need to raise funding (e.g., through higher taxes) might be mitigated or even reversed through the boost to demand for advanced imports by the “recipient” states from the “donor” states, as cohesion expenditures are used to boost investment in physical infrastructure, training, R&D, etc.

The issues that arise in the investigation of the direct benefits to recipient states of cohesion expenditure are complex in themselves, and an understanding of this process is obviously a prerequisite to the further investigation into the possibility of knock-on benefits to donor states. Our report includes a study of these direct effects of cohesion policy, for the programming period 2000-2006. Only then are we in a position to investigate the indirect spillover impacts on the donor states.

Given the great complexity of the issues, both for the direct and the indirect impacts, we stress that it will be difficult to provide any simple and definitive answers. Nevertheless, we present an initial quantification of the impacts, and we are able to draw some conclusions that are probably fairly robust. However, some of the benefits of our study are likely to arise as much from a better qualitative understanding of the mechanisms and wider consequences of cohesion expenditure as from our efforts to quantify these consequences on the basis of very explicit assumptions and using sophisticated economic models.

Analysis of the recipient and donor state impacts of cohesion expenditure requires the use of a considerable amount of economic theory, and of formalised computer models of both types of economy. Consequently, our study must draw on extensive research experience in the areas of macroeconomics, trade theory, growth theory, economic geography, as well as the more applied areas of macro-policy, macro-econometric modelling, forecasting and analysis in a wide range of areas of public policy, including country and regional case
studies. More specifically, we make use of previous research into cohesion expenditure impact analysis in the “old” beneficiary member states, carried out since the reforms of the late 1980s (i.e., in Greece, Ireland, Portugal and Spain); research in the “new” member states, ever since the early “pre-accession” development programmes of the late 1990s; and research that led to the development of new tools and techniques now widely used in cohesion policy analysis both in the Commission and in the recipient states. We also have to take into account the lessons learned from analysis of the impacts and benefits of the introduction of the Single European Market in 1992 and of Economic and Monetary Union, in 1999.

All this research is in the background of our work, and support for our conclusions must ultimately be based on the acceptability of our modelling research. Nevertheless, we try to present our main findings in terms of the logic of the analysis, where the ideas can be understood without any detailed knowledge of the technical modelling work that underpins it. Behind the technical analysis, there are some simple and robust ideas. These ideas are as important as the quantitative results.

1.2. The broad objectives of the study

The broad objective of the study is to analyse the manner in which cohesion expenditure affects donor member states (defined as net payers to the EU budget)\(^7\) by identifying and quantifying spillovers and leakages emanating from the recipient states and affecting the donor states. Most of the recipient member states can be classified as small open economies, often with narrow industrial bases, where many capital products or other goods which are vital for the implementation of the structural interventions are not produced at home. The gradual deepening of the Single Market implies that the imports required by the recipient states come predominantly from the more advanced industrialised EU economies. The main donor states, on the other hand, tend to be large, diverse and advanced economies, producing many of the kinds of capital and other goods and services that are required by recipient states as they go through a process of development and faster growth.

We stress that the term “small” in “small open economy” is used in an economic sense, and not simply in the more conventional spatial or demographic senses. Hence, even when economies like Spain (an “old” recipient state) or Poland (a “new” recipient state), both large territories with populations of about 40 million, do produce a wider range of manufactured goods and market services than spatially smaller economies such as Ireland, the three Baltic States, or Slovenia, nevertheless, Spanish and Polish firms still tend to have more limited market (or price setting) power compared to the larger donor states such as Germany, France, the United Kingdom or Italy, since their firms tend to operate on a smaller scale, and the goods and services that they produce are not always at the frontier of product innovation. In cases where a small open economy has specific industrial strengths through extreme specialisation (such as Ireland for computer software and pharmaceuticals), the main beneficiaries are often foreign-owned companies and much of the gains leak out of the host economy through multi-national profit repatriation.

A consequence for a small open economy, when it implements programmes of cohesion expenditure, is that the induced process of development is very likely to require higher

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\(^7\) Henceforth, we will abbreviate “donor member states (defined as net payers)” simply as “donor states”.
levels of imports of a wide range of goods and services from their main and more advanced trading partners. This is the manner in which the more developed donor states of the EU can reasonably expect to benefit indirectly from cohesion expenditure carried out by recipient states. As the Single European Market consolidates, an increasingly large fraction of the induced extra demand for imports by recipient states is likely to derive from increased exports of donor states. This is the complex phenomenon that is examined and evaluated in our report.

1.3. The specific objectives: six themes

The study is specifically designed to address the following six “themes”, which identify the principal mechanisms through which cohesion expenditures produce their effects on donor states. We list these themes in the same numerical order in which they were presented in the original call for tenders, although we will later show that they can be better addressed and analysed in a different logical sequence.

**Theme 1:** How much of economic growth in donor states can be attributed to cohesion expenditure interventions in recipient states?

This is the most aggregate statement of the goal of the study. We interpret “economic growth” as meaning “growth of aggregate GDP”, and “attribution” as requiring that all aspects of cohesion expenditure be explored, insofar as they affect donor states. In order to do this, we first need to understand the effects on the donor economies of having to finance their net EU budgetary contribution, part of which will be allocated by the Commission to finance EU cohesion expenditure programmes. Second, we need to understand the likely prior impacts of cohesion expenditure on the recipient states, since this is a necessary step in the analysis before we can then proceed to examine knock-on consequences for donor states. Third, we need to examine the spillover consequences of cohesion expenditure for the net donor states.

**Theme 2:** How do cohesion expenditure interventions influence the economic aggregates and the structure of the recipient economies? In particular, what part of the cohesion expenditure grants will be transformed into demand and production?

Here we need to carry out a detailed examination of how cohesion expenditure is likely to affect the economies of the recipient states. We interpret “economic aggregates” as meaning the main elements of GDP on an expenditure basis (i.e., private consumption, public consumption, investment, imports and exports) and on an output basis (i.e., GDP produced by the main sectors of the economy). We interpret “structure” to mean production structure. This can be examined at many levels. In our study, we will distinguish manufacturing, market services, building and construction, agriculture and general government. Knowledge of how cohesion expenditure is likely to affect GDP in the recipient states on an expenditure and output basis permits us to quantify the impacts on demand and production, and specifically to isolate net trade impacts.

**Theme 3:** How big a share of cohesion expenditure interventions will leak to more prosperous regions via increased demand for imports from these regions? How are imports from donor states likely to evolve compared with the situation without structural funding.

This theme follows logically from the previous two themes. To address it, we first need to isolate the impacts of cohesion expenditure on the trade of the recipient states in order to
identify impacts on the “net trade balance”, i.e., exports minus imports. If the net trade balance of a recipient state deteriorates compared to a “no-cohesion expenditure” scenario, then the impact will generate an increased net demand for imports by that recipient state. One must then identify the distribution of the extra demand for imports by the recipient state as between imports from EU donor states and imports from elsewhere in the EU and from the rest of the (non-EU) world.

Theme 4: What is the percentage of contractors from donor member states that have been awarded major public procurement contracts funded partly by cohesion expenditure?

Themes 1-3 above may be characterised as involving issues of “macroeconomics”, i.e., involving the behaviour of the economy taken as a whole, or in large sectors. Theme 4 is different, and is of a “microeconomic” character. It requires identification of contractors who were awarded major public procurement contracts associated with projects financed by cohesion expenditure, as well as identification of the nationalities of the contractors, in order to allocate them to EU donor or recipient states, or to the rest of the world.

Theme 5: How many jobs in donor member states depend upon cohesion expenditure financial transfers?

This theme reverts to an issue of generally “macroeconomic” character, as with themes 1-3 above. Essentially, it requires examination of how employment in the donor state economies will behave in a scenario “with cohesion expenditure” compared to a counterfactual scenario “without cohesion expenditure”.

Theme 6: What is the effect of cohesion expenditure transfers upon cash flows?

This theme can be interpreted in different ways. First, it can refer to the manner in which cohesion expenditure transfers (and the EU budgetary contributions more generally) operate through the current account of the balance of payments in the donor and recipient states. Second, it can refer to the impacts of cohesion expenditure transfers on the government balance sheet, i.e., on the public sector borrowing requirement, both in the donor and the recipient states. Third, it can refer to impacts on the profitability and cash flow of firms in the net donor and recipient states. All three interpretations can be explored and evaluated in the methodology to be described later in Chapter 3, and executed in Chapters 4 and 5.

To summarise, our report uses two distinct levels of analysis methodology. At the macroeconomic level, the analysis relates to benefits obtained by the recipient and donor states, measured in terms of macroeconomic aggregates (GDP, employment, etc.). This embraces Themes 1-3, plus Themes 5-6. At the microeconomic level, the analysis relates to benefits obtained by donor states arising from the implementation of selected types of interventions within cohesion expenditure programmes. This addresses Theme 4, i.e., the identification of firms and consortia from donor states who were awarded major public procurement contracts funded partly by the cohesion expenditure programmes.

8 With respect to the question of defining a “no-cohesion expenditure” counterfactual (or anti-monde) scenario, we will draw attention later to the fact that this is a more complicated concept to pin down than might be expected.

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1.4. The structure of the report

Chapter 2 is devoted to a concise description of the development of donor state contributions to the EU budget, as well as to the distribution of cohesion expenditure across all the recipient states. Although the cohesion expenditure programme for 2000-2006 (i.e., the programme that was completed on December 31st, 2008), is the principal focus of our analysis, we also include brief information on the planned expenditures being carried out during the current cohesion programme period that will cover the years 2007-2013. In addition to discussing how the aggregate cohesion expenditure data is usually described in terms of its constituent Operational Programmes, measures and individual projects, we explain how the “administrative” or “programmatic” form of the data needs to be reclassified into key “economic” categories, such as physical infrastructure, human resources and direct payments to private firms. Subsequent impact analysis takes place in terms of the three “economic” expenditure categories.

Chapter 3 provides background information on the analytic methodology used in the report. We have already drawn attention to the fact that it is simply not possible to move from the contributions made by donor states directly to the returns to the donor states without explaining the economic logic behind the analysis of the impacts of cohesion expenditure on the recipient states, and the mechanisms that link spillovers from the recipient states to the donor states. This material provides an essential part of the report, and underpins the subsequent presentation of quantified impacts.

In chapter 4 we describe how we quantified the impacts of the 2000-2006 cohesion expenditure programme on all the beneficiary states, making use of a system of specially designed economic models of these states.

Having quantified the impacts of cohesion expenditure on the beneficiary states, in Chapter 5 we turn to the main task of quantifying the spillover impacts on the donor states, drawing on the previous analysis of the direct impacts on the recipient states.

In Chapter 6 we turn to the micro-economic issue contained in Theme 4, and discuss how individual firms in donor states might benefit from the award of contracts under the cohesion expenditure projects.

Chapter 7 concludes, and draws together what we have learned, and makes a series of recommendations arising from the execution of the study.

The report also contains a Bibliography, to permit the reader to follow up on lines of information used in the body of the report. Annex 1 provides a short overview of the structure of the HERMIN models of the recipient states and the models of the donor states. Full technical information on the modelling system can be made available to interested readers, on request.

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9 It should be recalled that under the so-called “n+2” rule, two extra years are permitted at the end of a cohesion expenditure programme in order to permit completion of all projects initiated during the “core” years of the programme. Thus, expenditure for the programme that covered the “core” years 2000-2006 continued until the end of the year 2008. Expenditure for the current programme (2007-2013) will continue to the end of 2015.

KEY FINDINGS

• For the period from 1998 onwards, the net donor member states to the EU budget is a fairly stable group. In descending order of their net contribution measured in euro, these are: Germany, France, the Netherlands, Italy, Great Britain, Sweden, Belgium, Austria, Denmark, Luxemburg and Finland.

• Main recipient states from the EU budget in terms of cohesion expenditure are: Spain, Greece, Portugal, and Ireland. Since the EU enlargements of 2004 and 2007, all new member states are also net recipients.

• A comparison between the net donor states and the net recipient states points to an asymmetry when the shares (received or paid) are expressed as a percentage of national GDP. The shares for the net donor states are modest, and not higher than 0.5 per cent per year. The shares for the net recipient states are more significant, and range up to 4 per cent per year.

• The cohesion expenditure for the EU-15 amounted to around €231 billion for the programming period 2000-2006. Net recipient countries of the EU budget should receive 51.2 per cent, and 48.8 per cent were devoted to net donor states within the EU-15.

• The ten new member states joining in 2004 received 21.3 billion euro for the programming period 2004 – 2006.

• Actual data on the financial spending show that on average the allocated financial means have been fully utilized and only a very small residual was unspent from the programming period 2000-2006, after the extension to 2008 under the “n+2” rule.

• The main areas of intervention in terms of the three main economic investment categories were, in descending order: public infrastructure; human resources; and aid to private enterprises. The average shares across all of the recipient countries were 48.5, 35.9 and 15.6 per cent of the total, respectively.

• For the programming period 2007-2013, the cohesion expenditure budget has been enlarged to €341.1 billion (without technical assistance). About 75 per cent is devoted to net recipient countries and about 25 per cent for the net donor countries.
2.1. Net EU member state budget contributions for 1998 to 2007

In this chapter we briefly review the development of the net payments of the donor states and the net payments to the recipient states. The analysis is performed for the period from 1998 to 2007 and examines how the net payments have developed over these years and how important these payments are in relation to the respective gross national product.

Total EU spending in the year 2007 was just under €120 billion, and was equivalent to about 1 percent of EU27 GNP.\(^\text{10}\) The expenditure side the EU budget is made up of five main categories: (1) sustainable growth (mainly competition and cohesion policies for growth and employment); (2) preservation and management of natural resources (mainly agricultural and fishery policies and rural development); (3) citizenship, freedom, security and justice; (4) EU as a global player; and (5) administration. The largest categories are (1) and (2). For the year 2007, the budget share of category (1) was 43.4 per cent and for category (2) was 44.3 per cent.

On the revenue side, the budget contribution by member states amounts to basically one percent of each member's GNP. If we juxtapose the payments received by member states (mainly from the large expenditure categories (1) and (2) above) with the budget contributions made by member states, we can identify each state’s net financial contribution, and distinguish between net donor states and net recipient states. Net donor states are those whose annual receipts from the EU budget are less than their budget contribution. For net recipient states, their annual receipts are greater than their budget contribution.

Figure 3 shows the 11 member states that emerge as net donors over the period 1998 to 2007. Panel (a) of Figure 3 shows that Germany is by far the largest net contributor to the EU budget, with a contribution of about 40 per cent of the total. The other net contributors are the United Kingdom, France, Italy, the Netherlands, Sweden, Austria, Belgium, Denmark, Luxembourg and Finland. There are some fluctuations in some specific years, but no systematic changes concerning the positions as net donors. A somewhat different perspective emerges if we examine net contributions relative to the size of the economy. Panel (b) of Figure 3 shows the net contribution as a percentage of national GNP. The spread of net contributions lies between 0.1 and 0.5 percent of the respective state’s GNP. It is seen that Luxembourg and the Netherlands make the largest contributions when expressed as a share of their GNP. Germany’s share stands lower at 0.3 percent of its GNP in 2007, which is about the average contribution as a percentage of GNP across all the member states.

All the remaining 14 EU member states are net recipients from the EU budget. Until the EU enlargement in 2004, these were in descending order of the size of receipts: Spain, Greece, Portugal and Ireland. After EU enlargement in 2004, the ten new member states also fell into the category of net recipients, as well as Bulgaria and Romania, who joined in 2007. Figure 4 shows the development of net receipts for Greece, Ireland, Spain and Portugal whereas Figure 5 shows the New Member States, both using the same form of presentation as in Figure 3 above. In Panel (a) of Figure 4 and 5 the receipts are shown in millions of euro. In Panel (b) of Figure 4 and 5, the receipts are shown as a percentage of each country’s GNP. In the period from 1999 to 2004 Spain, Greece, Portugal and Ireland

\(^\text{10}\) In 2007, the EU budget stood at €113.95 billion, while EU-27 GNP was €12,220.6 billion (http://ec.europa.eu/budget/library/publications-fin_reports-fin_report_07_en.pdf)
obtained large financial gains from the EU budget, with the annual net financial influx ranging between 1 and 4 per cent of national GNP. After 2004 the new member states benefit from increasing net receipts from the EU budget. Attention is drawn to the case of Poland, the largest new member state in terms of the absolute size of its GNP, where the net receipts in the year 2007 are similar to those of Portugal.

A comparison between the net donor states and the net recipient states shows that there is a dramatic asymmetry in the shares received and the shares paid, when expressed relative to GNP. The net EU budget contribution shares for the donor states are modest, and not higher than 0.5 percent. The shares received are much more significant, and reach about 4 per cent of GNP for Spain in the year 1999. For most of the new member states, the shares are in the region of 1 per cent of GNP at the start (2004), and increase over subsequent years, reaching almost 3 per cent of GNP by the end of the period for some states.
Figure 3: Net contribution of the Donor States 1998 – 2007

a) In millions of euro
Figure 3: Net contribution of the Donor States, 1998 - 2007 by year (Continued)

b) As a percentage of national GNP

Austria (AT)

Belgium (BE)

Germany (DE)

Denmark (DK)

Finland (FI)

France (FR)

Italy (IT)

Luxembourg (LU)

Netherlands (NL)

Sweden (SE)

United Kingdom (UK)
Figure 4: Net Surplus of the “Old” Cohesion Countries, 1998-2007 by year

a) In millions of euro

b) As a percentage of national GNP
Figure 5: Net Surplus of the New Member States, 2004-2007 by year

a) In millions of euro
Figure 5: Net surplus of the New Member States, 2004-2007 by year (Continued)

b) As a percentage of national GNP

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<tr>
<th>Country</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Estonia</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Hungary</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Lithuania</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Latvia</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Malta</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Poland</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Slovenia</td>
<td>-0.20</td>
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<td>0.80</td>
<td>1.30</td>
</tr>
<tr>
<td>Slovakia</td>
<td>-0.20</td>
<td>0.30</td>
<td>0.80</td>
<td>1.30</td>
</tr>
</tbody>
</table>
2.2. Cohesion expenditure allocations for 2000-2006

Prior to the programming period 2000-2006, EU Structural and Cohesion Policy was channelled through five distinct “funds”: The European Regional Development Fund (ERDF) was used to finance infrastructure, job-creating investments, local development projects and aid for (small) firms. The European Social Fund (ESF) was used to finance training measures and other measures to support the human capital formation. The Guidance Section of the European Agricultural Guidance and Guarantee Fund (EAGGF) financed rural development and aid to farmers. The Financial Instrument for Fisheries Guidance (FIFG) financed the adaptation and modernisation of the fishing industry. Finally, the Cohesion Fund was used to finance environmental and large-scale infrastructure projects. While the first four funds could be used in any qualified region in the EU, after its introduction in 1993 the Cohesion Fund was restricted to the so-called “Cohesion-Countries”: Greece, Ireland, Portugal and Spain. Since the EU enlargements in 2004 and 2007, all new member states can be supported by the Cohesion Fund.

For the period from 2000 to 2006, three types of eligible regions were defined. First, Objective 1 regions were those whose development was lagging, and which had a level of income per capita that was below 75 per cent of the EU-average before the programme started. About 70 per cent of total funding was allocated to this objective. Second, Objective 2 regions were those who experienced structural difficulties (high unemployment, de-industrialisation, etc.). About 11.5 percent of Structural Funds were scheduled to these areas. Third, about 12.3 per cent of the Funds were reserved for Objective 3 regions, all outside the Objective-1 regions, to support the modernisation of training systems and the creation of employment. In addition there were some specific Community Initiatives that addressed very specific problems, such as cross-border cooperation (INTERREG III); sustainable development of cities and declining areas (Urban II); rural development through local initiatives (LEADER); and fighting inequalities and discrimination in access to the labour market (EQUAL), which had a total share of 5.4 per cent of the budget.

Tables 1 and 2 show the allocation of cohesion expenditure for the period 2000-2006. Table 1 refers to the pre-enlargement case of the EU-15, where Spain, Greece, Portugal and Ireland are the only recipients under the Cohesion Fund, and major recipients under Objective 1. Table 2 shows the allocations to the ten new member states, after their accession in 2004. They all benefit from both the Cohesion Fund, and under Objective 1 status.

11 During the pre-accession period the structural development of the New Member States was supported under different programme like PHARE, PHARE CBC, ISPA etc., but are not taken into account.
### Table 1: Cohesion expenditure in the EU-15 for 2000-6, in billion euro

<table>
<thead>
<tr>
<th>EU-15</th>
<th>D</th>
<th>Total Fund</th>
<th>Cohesion Fund</th>
<th>Total</th>
<th>Objective-1</th>
<th>Objective-2</th>
<th>Objective-3</th>
</tr>
</thead>
<tbody>
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<td>Spain</td>
<td>1</td>
<td>56,205</td>
<td>11,160</td>
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<td>38,096</td>
<td>2,651</td>
<td>140</td>
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<td>29,764</td>
<td>19,958</td>
<td>3,510</td>
<td>4,581</td>
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<td>2,522</td>
<td>3,744</td>
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<td>21,000</td>
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<td>6,251</td>
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<td>4,568</td>
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<td>15,666</td>
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<td>6,050</td>
<td>4,540</td>
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<td>3,480</td>
<td>3,482</td>
<td>0</td>
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<td>722</td>
<td>406</td>
<td>720</td>
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<tr>
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<td>913</td>
<td>489</td>
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<td>261</td>
<td>680</td>
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</table>

D=1 net recipient country, 0=net donor country, own calculations.


### Table 2: Cohesion expenditure in the New Member States for 2004-6, in billion euro

<table>
<thead>
<tr>
<th>EU-15</th>
<th>D</th>
<th>Total Fund</th>
<th>Cohesion Fund</th>
<th>Total</th>
<th>Objective-1</th>
<th>Objective-2</th>
<th>Objective-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>1</td>
<td>11,369</td>
<td>3,733</td>
<td>7,635</td>
<td>7,321</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>1</td>
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<td>994</td>
<td>1,853</td>
<td>1,765</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>2,328</td>
<td>836</td>
<td>1,491</td>
<td>1,286</td>
<td>63</td>
<td>52</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>1</td>
<td>1,600</td>
<td>510</td>
<td>1,09</td>
<td>921</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1</td>
<td>1,366</td>
<td>543</td>
<td>823</td>
<td>792</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Latvia</td>
<td>1</td>
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<td>461</td>
<td>575</td>
<td>554</td>
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<td>0</td>
</tr>
<tr>
<td>Estonia</td>
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<td>276</td>
<td>342</td>
<td>329</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Slovenia</td>
<td>1</td>
<td>406</td>
<td>169</td>
<td>237</td>
<td>210</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>54</td>
<td>50</td>
<td>50</td>
<td>0</td>
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<tr>
<td>Malta</td>
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<td>78</td>
<td>22</td>
<td>56</td>
<td>56</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

D=1 net recipient country, 0=net donor country

Within each recipient state, cohesion expenditure is allocated in the context of an overall development plan. Within the plan, there are a series of major Operational Programmes (OPs), and within each Operational Programme there are a large number of different intervention areas and measures designed to enhance growth and employment. In order to prepare the aggregate cohesion expenditure for analysis using macroeconomic tools (to be discussed in the next chapter), it is necessary to simplify this range of policy initiatives and reduce it to a much smaller number of generic economic interventions. In all previous analysis carried out by the Commission, it has been found useful to use the following three categories:

i. Measures designed to support investment in physical infrastructure;

ii. Measures designed to support expenditure on human resources (i.e., vocational education, training, labour market integration, etc.);

iii. Measures designed to provide support to private enterprises (investment grants, R&D, etc.)

Based on a very detailed analysis of the original recipient member state National Plans and the detailed Operational Programmes for the 2000-2006 programming period, we have reclassified the cohesion expenditures into the above three categories. In addition, within the aid to the private enterprises category, a separate categorisation between aid to different sectors (e.g., manufacturing, market services and agriculture) is made. Finally, within the aid to the enterprise sector, special consideration was given to expenditure on research and development (R&D). For the ten new member states, these reclassifications were based on the 2004-2006 expenditure programme.

The breakdown between the three classes in investment is shown in Table 3, and differs between member states, since the design of the Operational Programmes is country specific. With the exception of Slovenia and Cyprus the most of the cohesion expenditure is devoted to the enhancement of physical infrastructure, with shares ranging between 40 and 70 per cent of the amount. The second most important interventions areas across the recipient countries are in the human resources category. The range of the shares here is between 20 per cent (in Lithuania and Malta) and 40 per cent (for Slovakia). An exception within this category is Cyprus, where more than 70 per cent of cohesion expenditure is devoted to human resources. In all recipient states, the category “aid to enterprises” generally shows smaller shares, with the lowest share of only 3.7 per cent for Slovakia, but a range of between 10 and 20 per cent across most of the other recipient countries. Exceptions with the two highest shares are Latvia (25 per cent) and Slovenia (40 per cent).

An interesting observation is that the four old “Cohesion countries” Spain, Portugal, Ireland and Greece have relatively similar shares for all three categories of investment, while the new member states show significant differences between these three shares. In all cases, the actual financial spending profile for each recipient country and the distribution across the economic categories form the basis for the analysis of the return to the donor states for the cohesion expenditure period from 2000 to 2006. However, under the so called “n+2” rule, the pattern of cohesion expenditure extends over the period 2000-2008 for the four old member states, and over the years 2004-2008 for the ten new member states.
Table 3: Breakdown of Cohesion Expenditure into broad economic categories for the period 2004-2006, in percentage

<table>
<thead>
<tr>
<th>Country</th>
<th>Physical Infrastructure</th>
<th>Human Ressources</th>
<th>Aid to enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>43.96</td>
<td>39.82</td>
<td>16.21</td>
</tr>
<tr>
<td>Estonia</td>
<td>50.13</td>
<td>38.88</td>
<td>10.99</td>
</tr>
<tr>
<td>Greece</td>
<td>62.52</td>
<td>27.16</td>
<td>10.32</td>
</tr>
<tr>
<td>Spain</td>
<td>53.17</td>
<td>33.92</td>
<td>12.91</td>
</tr>
<tr>
<td>Ireland</td>
<td>50.29</td>
<td>39.27</td>
<td>10.45</td>
</tr>
<tr>
<td>Cyprus</td>
<td>16.30</td>
<td>72.93</td>
<td>10.77</td>
</tr>
<tr>
<td>Latvia</td>
<td>42.37</td>
<td>32.75</td>
<td>24.88</td>
</tr>
<tr>
<td>Lithuania</td>
<td>64.58</td>
<td>18.72</td>
<td>16.70</td>
</tr>
<tr>
<td>Hungary</td>
<td>50.29</td>
<td>28.75</td>
<td>20.97</td>
</tr>
<tr>
<td>Malta</td>
<td>71.71</td>
<td>19.27</td>
<td>9.02</td>
</tr>
<tr>
<td>Poland</td>
<td>54.82</td>
<td>35.47</td>
<td>9.71</td>
</tr>
<tr>
<td>Portugal</td>
<td>53.01</td>
<td>33.89</td>
<td>13.10</td>
</tr>
<tr>
<td>Slovenia</td>
<td>21.85</td>
<td>37.82</td>
<td>40.33</td>
</tr>
<tr>
<td>Slovakia</td>
<td>52.31</td>
<td>43.92</td>
<td>3.77</td>
</tr>
</tbody>
</table>

Source: DG Regional Policy, own calculations.

2.3. Cohesion expenditure allocations for 2007-2013

The analysis of the programming period 2000 to 2006, extended to 2008 under the “n+2” rule, is the main focus of our report. However, the ten new member states only benefitted from cohesion expenditure for the shorter five-year period, 2004-2008. The four old member states had implemented cohesion expenditure programmes ever since the reforms of 1989. Consequently, planned expenditures tended to be implemented fairly efficiently. However, in the case of the new member states, implementation of the planned expenditures tended to be delayed, as new systems and procedures had to be put in place. Consequently, much of the actual expenditure was “back loaded” to the final two to three years.

To conclude this section we briefly look at the current programming period, 2007 to 2013. Compared to the 2000-2006 programming period, the cohesion expenditure budget has been extended to €347.4 billion, compared to around €235 billion of the previous period. As a result of further reforms, the new cohesion expenditure objectives are three-fold: “Convergence”, “Regional Competitiveness and Employment”, and “European Territorial Cooperation”. The objective “Convergence” is identical to the former “Objective 1” categorisation. The “Regional Competitiveness and Employment” objective now covers all those areas that are not classified as “Convergence”.

The main focus of the Cohesion Policy is the Convergence objective, as shown in Table 4. Almost 83 per cent of funds are allocated to the less developed (convergence) regions within the now enlarged EU of 27 members. The remaining areas receive only 15 per cent of the total budget, with the remainder going to the “Territorial Co-operation” category. The spatial focus of expenditure is now mainly on the new member states. Table 4 shows
that three quarter of the total cohesion expenditure is being allocated to the net recipient states, with the remaining quarter being spent within the net donor states.

Table 4: Cohesion Expenditure 2007-2013:
Indicative Financial Allocations, in million euro, current prices

<table>
<thead>
<tr>
<th>Country</th>
<th>D</th>
<th>Convergence in mill. €</th>
<th>Regional Competition and Employment</th>
<th>European Territorial Cooperation</th>
<th>Total</th>
<th>percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
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<td>638.00</td>
<td>1,425.00</td>
<td>194.00</td>
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</tr>
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<td></td>
<td>179.00</td>
<td>6,853.00</td>
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</tr>
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<td>247.00</td>
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</tbody>
</table>

Remark: Technical assistance (855 million euro) not take into account
Source: DG Regional Policy, own calculations. D=1 net recipient country, 0=net donor country
3. METHODOLOGY FOR INVESTIGATION OF COHESION EXPENDITURE IMPACTS

KEY FINDINGS

- We set out an explanation of the methodology that must be developed to address the five “macroeconomic” themes of the project.

- We describe how the cohesion expenditure data, classified initially in to administrative, or programmatic categories, must be reclassified into three broad economic categories: physical infrastructure, human resources and direct support to private firms (including R&D).

- We show how research findings from the international literature can be used to obtain estimates of the likely supply-side impacts of the three investment categories on the economies of states in receipt of cohesion expenditure support.

- We show how the HERMIN system of models of the recipient states can be used to estimate the impacts of cohesion expenditure on all aspects of the economy. In particular, we quantify the trade-enhancing impacts as recipient states expand their demand for imports of capital and other goods to implement the investment policies.

- We also show how the spillover benefits from recipient to donor state can be quantified using the HERMIN models of the donor states.

- We stress that the above complex policy challenge is made even more complex by the fact that there is no solid consensus in the policy research literature concerning any of the above stages. However, a carefully structured investigation, where all stages are explained, examined critically, and empirical evidence is gathered, serves to focus attention on areas where there is broad agreement and other areas where controversy reigns and debates will continue.

3.1. Introductory remarks

The task of evaluating all of the impacts of EU cohesion expenditure would be relatively straightforward if the Commission policy makers were able to carry out the following kind of hypothetical experiment:

i. Select two identical potential recipient countries at a given point in time.

ii. Allocate cohesion expenditure support to one of the two countries, but not to the other.

iii. Wait for about twenty years
iv. Compare the performance of the recipient country with the non-recipient country

v. Assign any differences in performance to the impact of cohesion expenditure, since every other aspect of the two countries’ performances is assumed to be identical.

In the context of economic policy, such an approach is manifestly infeasible. The experimental procedures commonly used to evaluate the impact of a new pharmaceutical drug cannot easily be carried over to the field of economic and social policy making. The most difficult challenge facing researchers as they attempt to isolate and identify the impacts of a specific economic policy is the question of the policy “counterfactual” or “anti-monde”. In other words, one needs to be able to define how an economy would have performed in the absence of the policy action before one can address the question of the impact of the policy.

The fact that a recipient economy performed well during and/or after cohesion expenditure programmes were implemented cannot be taken as evidence that the cohesion policies were the root cause of improved performance. As previously noted, the typical recipient country is a small open economy, buffeted by a wide range of forces emanating from the global economy and – to an additional extent – by purely internal domestic policy and other local actions. One needs to identify these global and domestic influences before one can attempt to assign a specific role to cohesion expenditure policies. This is why we need economic models to investigate the likely impacts of such policies. Without models to enable one to define a policy “counter-factual”, one can only monitor the implementation of cohesion expenditure, i.e., establish if the funds are being spent according to the priorities identified and agreed in the National Development Programmes or the National Strategic Reference Frameworks (NSRFs), and according to the planned time schedule.

In the cohesion policy evaluation literature, monitoring and impact evaluation are often confused. Monitoring addresses what is being spent, and how intermediate performance and achievement targets are being attained (e.g., kilometres of new roads, numbers of workers trained, R&D projects completed, etc.). Evaluation, on the other hand, addresses the deeper question of what are the wider economic consequences of cohesion expenditure in terms of the enhanced performance of the economy (higher GDP, increased employment, higher productivity), both during and after implementation of the programmes.

Computer-based economic models are complex tools, designed, constructed and used by researchers. Although they cannot pre-determine the answers to economic questions (such as forecasting the future or identifying and quantifying policy impacts), they lie behind all economic policy analysis, either explicitly or implicitly. However, there is no consensus about the nature of models, and disputes about how economies actually function are carried over into disputes on how economies are modelled. For example, the Commission’s Fourth Cohesion Report, published in 2007, presented cohesion expenditure impacts evaluated using three different economic models: the QUEST model operated by DG-ECFIN; the HERMIN model developed for use in DG-REGIO and in recipient countries; and ECOMOD, developed by the Free University of Brussels. Our analysis is based on the HERMIN system of models. However, in this report we try to make our methodology and analysis as transparent as possible to permit readers to identify crucial assumptions and to be able to judge the wisdom of these assumptions.

12 Bradley and Untiedt, 2008a gives details of the QUEST, HERMIN and ECOMOD simulations, and explores the question of how models differ, and what are the policy analysis consequences of these differences.

13 Bradley and Untiedt, 2008b gives complete information on the HERMIN models developed for the recipient states. Bradley and Untiedt, 2009 describes the new HERMIN models of the donor states.
The remainder of this chapter is organised as follows, and is designed to explain the sequence of methodological steps in our analysis.

i. First, we review some methodological issues relating to the cohesion expenditure programme that we later analyse in detail, i.e., covering the programming period 2000-2006), and we also comment briefly on matters relating to the current 2007-2013 programming period.

ii. We then revisit the requirement to re-classify the administrative financial allocations into three broad economic investment/expenditure categories: physical infrastructure, human resources and direct support to private firms, and the manner in which these three types of investment affect the supply side of the recipient economy are described, drawing on a range of international research resources.14

iii. Since we need to make use of computer models, we briefly outline some of the structural features of the HERMIN model system that we use in subsequent analysis. Complete technical information on the models is available in Bradley and Untiedt, 2008b and Bradley and Untiedt, 2009. Here we focus on the non-technical aspects that underpin the subsequent analysis.

iv. We have already drawn attention to the need to derive a “no-policy” counter-factual out-turn. We outline how we can use the HERMIN models of the recipient states to derive such an out-turn, and to use it to quantify the impacts on the recipient states of the investments funded by cohesion expenditures. This includes the necessity to carry out sensitivity analysis to allow for an inherent degree of uncertainty in such analysis.

v. We then discuss the kinds of mechanisms through which the impacts of cohesion expenditure on recipient states are likely to spill over to affect donor states. We outline a sequence of approaches to evaluating the net impacts of cohesion spending on the donor states, where the financing costs to the donor states in terms of higher taxation can be offset by the increased demands for donor state exports, mainly during the programme implementation phase.

3.2. Cohesion expenditure programmes: methodological issues

The primary time horizon of the study is designed to cover one complete EU programming period, namely 2000-2006. At the time of writing (April, 2009), the ex-post expenditures in this programming period are almost complete. However, fairly accurate estimates can be made in cases of incomplete data, based on financial plans.

Even through we mainly analyse the 2000-2006 programming period, we suggest that some forward-looking consideration should also be given to the current programming period, 2007-2013, for the following reasons. First, ten of the new member states have only participated fully in EU cohesion expenditure programmes since their accession in 2004. Second, two new member states, Bulgaria and Romania, the least developed economies of the EU, only started to participate from January 2007. Third, the main “old” member states (i.e., Greece, Ireland, Portugal and Spain), who received enhanced cohesion

14 In our report we will continue to use the term “investment” to describe cohesion expenditures on physical infrastructure, human resources and R&D, even though only the first type of expenditure is conventionally classified as “investment” in standard national accounting terminology.
expenditure aid starting after the major reforms of the EU budget in 1989, are now in receipt of a much smaller fraction of total aid. The implication is that policy conclusions drawn from analysis of mainly “old” recipient states over the period 2000-2006 may not be typical of the policy conclusions that could be drawn from analysis of the “new” recipient states, since many of these latter states are still at a relatively low state of development and have trading patterns and characteristics that are quite different from those of the “old” member states.

It should also be noted that some donor states benefited from cohesion expenditure during the period 2000–2006, especially under Objective 2 and to a minor extent under Objective 1. But we do not analyse these economic impacts within the donor state for the following reasons. First, when expressed as a fraction of GDP of the donor states, the amount of cohesion expenditure is very small, so that the results at the macroeconomic level will also be correspondingly small and difficult to identify separately. Second, the fact that the two largest Objective 1 “macro-regions” of East Germany and the Italian Mezzogiorno are parts of two of the EU’s largest economies implies that much of the spillovers from these regional expenditures are almost certain to remain within Germany and Italy, respectively, and are unlikely to leak out into other donor states. Therefore, we ignore the spillover effects that arise from cohesion expenditures that take place within donor states and we concentrate on spillover effects that arise in recipient countries. Consequently, the calculation of the extent to which any of the eleven donor states benefits from cohesion expenditure consists of two main elements, as follows:

| Indirect benefits from positive spillovers originating in recipient states |
| less Costs of financing the “net” donor contribution. |

The planning for cohesion expenditure programmes is done in terms of a small number of broad priorities, but within each priority are included many individual measures and projects. Monitoring of the programme progress takes place at the most disaggregated level of detail. In other words, from a monitoring point of view, it is necessary to establish at the level of measures and individual projects whether or not the elements of the programme are being implemented according to the proposals negotiated and agreed between the Commission and the recipient state. Monitoring at the higher level of broad priorities, or at the level of the whole programme, is then simply based on the aggregation of monitoring studies at the lower levels.

Analysis of the impact and effectiveness of cohesion expenditure can also proceed at different levels, where the essential difference between levels is the extent to which the rest of the economy may be assumed to remain unchanged while a specific aspect of policy is investigated. These three stages of evaluation can be designated as micro, meso, and macro.

In the case of an individual project (e.g., a particular stretch of road, a particular training scheme for long-term unemployed, etc.), a conventional cost-benefit analysis could be carried out, with competing projects ranked in terms of increasing internal rate of return. Such analysis, however, gives rise to obvious difficulties in relation to the need to evaluate
the impact of spillover effects and externalities in the context of the complete programme. Moving up the scale of aggregation, the totality of projects targeted at a general or systemic problem (say, long-term unemployment or industrial competitiveness), could be evaluated in terms of how successful they are in attaining their overall priority objective. Finally, the effectiveness of an entire cohesion expenditure programme could be evaluated as an integrated whole. Given the size of cohesion expenditure in relation to the size of a typical recipient economy, and the obvious implications for domestic fiscal policy, it is necessary to examine impacts in a manner that includes economy-wide feedbacks and interactions, attempting to account for all spillover effects arising from the policies. Here one needs to make use of formal economy models. Our report deals almost entirely with this higher level of analysis.\(^\text{15}\)

### 3.3. Public investments and supply side impacts

Over the last two decades there has been renewed interest in the determinants of economic growth. The focus of much of this work has been to model more explicitly the policy and other influences which impact on a country’s growth rate, either in the short run or the long run. This approach stands in contrast to earlier research which explained economic growth simply through external (or exogenous) technical progress, the sources of which were not properly understood or explicitly modelled (Solow, 1956). In these earlier models, growth was essentially externally driven. The early research also predicted steady and automatic convergence among economies with similar rates of technical progress, due to diminishing returns to higher investment. According to these earlier models, no cohesion policy interventions were necessary.

Recent advances in the study of economic growth have addressed these obvious shortcomings. In particular this literature has focused on the role of spillovers which arise from particular public investment activities, such as infrastructure, human capital and R&D. These spillovers provide additional, unintended, benefits to the productive performance of an economy. For example, research has explored how technical progress (or productivity growth) can be influenced directly through investments in research and development (R&D). Here, spillovers can also arise when innovations in one firm are adopted by other firms, i.e. when such innovations have public good qualities. In contrast to the earlier growth theories, convergence is found to be no longer automatic in the “new” growth models. In the absence of policy-induced “drivers” of growth, a lagging economy can stagnate or fall further behind more dynamic economies, where such “drivers” operate effectively. In such a world, there is a role for cohesion policy interventions.

These theoretical advances have also led to an extensive empirical literature which investigates growth effects, and there now exists a considerable body of work dealing with the effect of infrastructure on growth. Work on the impacts of human capital and R&D on growth is less extensive.

#### 3.3.1. The role of physical infrastructure

Much of the recent research on the growth effects of improved infrastructure has focused on the estimation of the rate of return to investment. This rate of return is inferred from empirical studies of how increases in the “stock” of infrastructure can increase output,

\(^{15}\) For reviews of research in cohesion expenditure evaluation methodologies, refer to Bradley, 2000 and Bradley, 2006.
derived under the assumption that public infrastructure mainly enters into the production process as an “intermediate” input, along with private labour and capital.

Overall a consensus is emerging that improvements in the quality of infrastructure have a positive impact on growth. However, the size of that impact has been in dispute ever since the early research work of Aschauer (1989), who suggested optimistically that a one per cent increase in the stock of infrastructure would increase output by between 0.4 and 0.8 per cent.16 Numerous studies have subsequently addressed this issue, with many researchers finding a positive impact of infrastructure, but often a more modest one than found in early work of Aschauer (1989). In summary, studies suggest that values for the elasticity of output with respect to infrastructure between 0.1 and 0.4 appear feasible and reasonable. Romp and de Haan (2007) is a comprehensive, up-to-date review of this field of research.

Most of the international research that examines the growth-enhancing role of infrastructure originates in the advanced economies, including the larger EU donor states. Some results are available for the “old” recipient states, but none for the new member states. Consequently, one has a somewhat better understanding of the position in the more advanced economies than in the less developed economies of the EU. Economic theory suggests that the returns to increased investment in physical infrastructure in advanced economies is likely to be lower than in less advanced economies. The international literature, based as it is mainly on studies from advanced, developed economies, probably provides a lower bound to the likely magnitudes of the impacts in less developed economies. Of course, these impacts are likely to be higher only if the investment programmes are well designed and efficiently executed. We return to this issue in the next chapter, when we use the HERMIN models to evaluate cohesion expenditure impacts.

### 3.3.2. The role of human capital

The debate in the research literature on the effects of human capital on aggregate output and productivity is still ongoing and no clear consensus has yet emerged. This is despite the fact that, at the level of the individual, returns to schooling have been found to be positive and highly significant (see Barrett, Callan and Nolan, 1999).

One of the main challenges in this line of research relates to the definition of the human capital variable to be used in analysis. Some authors use the school or training enrolment rate, i.e. the percentage of the working population of school age, or of the labour force, which is in education or training at a point in time (Mankiw, Romer and Weil, 1992). However, this does not measure the stock of human capital in an economy at that point in time, but rather measures the potential for future additions to that stock. An alternative measure is the average years of schooling of the labour force which is a more appropriate measure of the stock of human capital (Benhabib and Spiegel, 1994). However, even this measure is far from perfect since it does not account for school quality which some researchers measure using the amount of expenditure on education. Higher expenditure does not automatically result in better quality of education and training, particularly if a substantial proportion of the funds are used in an inefficient way.

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16 Economists describe the result where a one per cent increase in the stock of infrastructure leads to a 0.4 per cent increase in GDP briefly and cryptically as: “the elasticity of GDP with respect to infrastructure is 0.4.”
In an influential paper, Mankiw, Romer and Weil (1992), using an international cross country data set, found that the output elasticity with respect to human capital, as measured by the secondary school enrolment rates, is in the region of 0.3. In other words, increasing the enrolment rate by one per cent would increase GDP by 0.3 per cent. Other studies have found both smaller and larger elasticities. The literature suggests that, on balance, human capital is likely to have a positive impact and that the output elasticity is probably in the range of 0.1 to 0.4. However, existing studies have yet to quantify what might be termed “internal” spillovers of human capital, i.e., the additional productivity effect of the presence of a highly educated/trained worker on workers with lower human capital.

In order to study the relationship between human capital and growth, it is necessary to have a methodology for measuring the level or the flow of human capital. In most studies in this area a simple approach is adopted that does not distinguish between the level at which the education takes place (see Sianesi and Van Reenen, 2004 for a comprehensive survey). In such approaches, years spent in education and/or training are simply counted and (for example) years in primary school are treated in the same way as years spent on vocational training courses or in university. However, in the case of most of the recipient countries to be examined in our report, reliable and comparable data are collected annually by the OECD, together with a common classification of different types of education. In order to measure the impact of that proportion of the EU cohesion expenditure that is devoted to the development of human capital, a starting stock of human capital is developed for use in our models, based on four different levels of educational attainment, starting at the elementary level, and working up:

i. Primary and lower secondary education
ii. Higher secondary education
iii. Non-university tertiary education
iv. University education

Primary and lower secondary education are grouped together since these are the most basic levels of education, and lower second level education tends to be the minimum level of education attained by children who reach the legal age at which they can leave school. Increasingly higher weights are assigned to stages (ii) up to (iv), with level (i) assigned a very low weight, since it is regarded as a prerequisite for the attainment of higher skills that are productivity-enhancing in the modern labour market. Inside our HERMIN models, the cohesion expenditure on ESF programmes is translated into an increased flow of education and training, and these are accumulated into an increased “stock” of human capital. 17

3.3.3. The role of R&D

We single out expenditure on R&D for special consideration from other cohesion expenditure directed towards assisting private firms. This is because R&D represents the element of such expenditures that is most likely to accumulate over time and generate spillovers within the recipient economy that will persist even after the R&D boost is complete (i.e., after the cohesion programme terminates). The other elements of direct assistance to firms is more likely to generate a transitory benefit, broadly of a Keynesian kind, and may not provide as much by way of post-programme sustained returns. This

17 Bradley and Untiedt, 2008b provides more detail of how the baseline "stock" of human capital is defined.
may be over pessimistic, but in the absence of any credible micro-studies of sustained benefits, it is probably the most prudent approach to adopt in policy evaluation.

The quantification of the likely impacts that investment spending on R&D has on economic growth is the most difficult of the three economic investment categories to analyse. Most research in this area consists of theoretical explorations of the role of R&D in promoting growth, within the context of new theory-based models of growth. Empirical research into R&D impacts is still at an early and experimental stage. An extensive survey of research has been carried out by the US Congressional Budget Office (CBO, 2005). Unfortunately, most of the empirical investigation centres of the analysis of cross-sectional data at a specific point in time. This is to be contrasted with the analysis of time series data over an extended period of time. The CBO survey suggests that the impacts of R&D derived from cross-sectional studies tend to be both larger and more significant than those derived from time series analysis. The CBO survey also suggests that the returns from public investment in R&D tend to be lower than the returns from R&D carried out by the private sector. Finally, the empirical findings are even less robust than those found in comparable analysis of the impacts of physical infrastructure and human capital on output.

One possible implication of the uncertainty in the international literature concerning the likely returns to investment in R&D is that one might, as a precaution, consider setting the spillovers of R&D investments of cohesion policy to zero. In that case, there would only be transitory (or Keynesian) impacts during the actual implementation period of the programmes (i.e., between the years 2000-2008), which would vanish completely after the programme was terminated. However, we consider that this is an extreme position to adopt. But the alternative of setting the rates of return from R&D investment at the higher values typically found from studies of physical infrastructure and human capital would also be extreme, and probably unrealistically optimistic. In our subsequent simulation analysis (to be reported in Chapter 4) we adopt rather low values of the spillover effects of increases in the stock of R&D on output and productivity. This minimizes any risk of overstating the impacts. A more precise analysis and quantification will have to be postponed until there is greater detail on the exact nature of the cohesion policy R&D measures, and until the international literature progresses and examines the situation in the recipient states.

3.4. Choosing an appropriate economic model

The HERMIN macro model framework, which we use in this report, was developed initially in Ireland in the late 1980s, specifically to evaluate the macroeconomic impacts of cohesion expenditure.\(^\text{18}\) HERMIN was designed to take account of limited data availability in the poorer, less-developed EU member states, initially Greece, Ireland, Portugal and Spain, but was gradually extended to include all the new EU member states from 2000 onwards. The HERMIN model was based on a fairly simple theoretical framework that permitted inter-country comparisons to be easily made and which facilitated the “calibration” of the country

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\(^{18}\) Its origins lay in the complex multi-sectoral HERMES model that was developed by the European Commission from the early 1980s (D’Alcantara and Italianer, 1982). See Bradley et al, 1992 for an early application of the Irish model. Bradley and Untiedt, 2008b provides the most recent description of the HERMIN system of models of the recipient states. This report is the first time that the models were extended to the eleven donor states (Bradley and Untiedt, 2009).
The Economic Return of Cohesion Expenditure

models, i.e., the selection of key behavioural parameters, since sophisticated statistical calibration was difficult due to lack of data.¹⁹

HERMIN was designed for analysis of medium-term policy impacts involving large-scale public investments in physical infrastructure, human resources and R&D. Such analysis requires that the model has certain basic structural features:

i. It must be disaggregated into an adequate number of production sectors to permit the examination of key sectoral shifts in the economy as it develops and reacts to policy shocks.

ii. It must specify mechanisms through which a “lagging” economy connects to the external world: through trade, inflation transmission, migration and foreign direct investment.

iii. It must recognise a possible conflict between the actual situation in the country, captured in a model calibrated with historical data, and the desired situation towards which the lagging economy is evolving. In other words, one wants to have a model of the present and likely future properties of the economy, and not one that looks back to an earlier and now irrelevant structure.

These structural requirements have implications for the more detailed features of the model. One needs to focus carefully on the degree of economic openness, exposure to world trade, and response to external and internal shocks. The relative sizes and features of the traded and non-traded sectors and their development, production technology and structural change become crucial mechanisms in the change process. Mechanisms of wage and price determination, the functioning and flexibility of labour markets and the possible role of international and inter-regional labour migration determine competitiveness relative to more developed economies. Development possibilities can be constrained through fiscal and other imbalances, emphasising the role of the public sector and the consequences of public debt accumulation, as well as the interactions between the public and private sector trade-offs in public policies.

To satisfy these requirements the HERMIN framework was designed with five production sectors: manufacturing, market services, building and construction, agriculture and government (or non-market) services. Conventional “Keynesian” mechanisms are included in the HERMIN model. Hence, expenditure and income shocks can generate standard multiplier mechanisms, whose size depends on the openness and other properties of the economy.²⁰ But the model also has many “neoclassical” features, in the following sense. Output in manufacturing, for example, is not simply driven by demand. It can also be influenced by price and cost competitiveness, where firms seek out minimum cost locations for production (Bradley and Fitz Gerald, 1988). In addition, the demands for labour and capital in the manufacturing, market services, and building and construction sectors are derived from a production function constraint, where the ratio of capital to labour ratio is

¹⁹ Economic models are usually “calibrated” using econometric techniques that require at least twenty to twenty-five years data. In the new member states, only data from about 1995 are usable, providing just thirteen observations for the period 1995-2007.

²⁰ The “Keynesian multiplier” states that an increase in public expenditure will increase total expenditure by a multiple of that increase. Hence, governments can stimulate the economy if people who receive this money then spend some of it on consumption goods and save the rest, and this extra spending allows businesses to hire more people and pay them, which in turn allows a further increase consumer spending. This process continues, the multiplier process tapers off, and eventually reaches an equilibrium. The multiplier is reduced the more open the economy becomes, and in the presence of taxation. Increases in imports and in tax payments at each step reduces the size of the multiplier effect. Hence, multipliers in small open economies (such as the recipient states) tend to be much smaller than in larger, more closed economies (such as some of the donor states).
sensitive to the cost of labour relative to the cost of capital (i.e., relative factor prices).\textsuperscript{21} The incorporation of unemployment as a determinant of wage bargaining introduces further relative price effects.

The dramatic nature of structural change in the “old” recipient economies suggests that the data sample should be restricted to the post-1980 or post-1985 period. In the case of the economies of the new member states, data availability requires one to work with only about thirteen annual observations for the period 1995-2007, since data prior to 1995 are incomplete and not very reliable. The small number of observations available prevents one from undertaking sophisticated econometric estimation and hypothesis testing techniques commonly used to calibrate macro models. Consequently, various different approaches to model calibration (or estimation) are used for the new member states models.\textsuperscript{22}

Two related issues are involved with the models of formerly centrally planned economies. First, the standard macroeconomic and market relationships that characterise “old” recipient economies may already exist in some of the more advanced new member state economies such as the Czech Republic and Slovenia (e.g., sensitivity to international cost-competition and wage determination mechanisms that are becoming consistent with the need to maintain a cost-competitive position in the global economy). But we may simply have too few data observations to isolate the magnitudes of the relevant elasticities and parameters in most of the “new” member states, at least in a stable and robust way. Second, it may be the case that these relationships are not yet fully developed, but will develop in future as these economies integrate further into the single European market. Consequently, the experimental and speculative nature of the models for Romania and Bulgaria must be kept in mind and policy simulations regarded as somewhat exploratory.

Turning now to how cohesion expenditure programmes influence recipient economies, this happens through a mixture of supply and demand effects. Short term demand (or Keynesian) effects arise as a consequence of increases in expenditure and income policy instruments associated with the cohesion expenditure initiatives. Through “multiplier” effects there may be further knock-on increases in all the components of domestic expenditure (e.g., total investment, private consumption, the net trade surplus, etc.) and the components of domestic output and income. These demand effects are unlikely to be large, since the recipient economies are very open, and are of transitory importance. Even if they bring benefits to the recipient economies, they are not the principal raison d’être of cohesion policy. Rather, the interventions are intended to influence the long-run supply potential of the economy.

The “supply-side” effects arise from the nature of the cohesion programmes, through policies designed to:

i. Improve physical infrastructure as an input into private sector production;
ii. Increase human capital, through investment in training and education, as an input to private sector productive activity;
iii. Channel public financial assistance to the private sector to stimulate investment and productive efficiency, thus increasing factor productivity and reducing sectoral costs of production and of capital.

\textsuperscript{21} More technically, such “neoclassical” features constitute what are called the “micro-foundations” of the macro structure of the model and are an essential feature of any model intended for use over a long time horizon.

\textsuperscript{22} Complete information on the design and construction of the HERMIN models of the recipient states is available in Bradley and Untiedt, 2008b.
What do we mean by “supply side” effects? Cohesion interventions are designed to improve the aggregate stock of public infrastructure, human capital, and R&D, as well as boost the equivalent private capital stocks. Providing more and better infrastructure, increasing the quality of the labour force, or providing R&D incentives to firms, are the key mechanisms through which the cohesion expenditure programmes can improve the output, productivity and cost competitiveness of the recipient economies. The longer-term effects of these policies are to create conditions where private firms enjoy the use of higher quality inputs of labour and capital, sometimes at no cost to themselves. Alternatively, the cohesion policies help to make the current private sector inputs that firms are already using (such as labour and capital) available to them at a lower cost, or the general conditions under which firms operate are improved by the policies. In all these ways, positive spillovers arise out of well designed and efficiently executed cohesion expenditure programmes.

Two main types of beneficial supply-side spillovers are likely to enhance the demand-side (or Keynesian) impacts of well designed investment, training and R&D programmes. The first type of spillover is associated with the role of improved physical infrastructure, training and R&D in boosting output directly. This works through mechanisms such as attracting productive activities through foreign direct investment, and by enhancing the ability of indigenous industries to compete in the domestic and international market places. We call this an ‘output spillover’ since it is well known that the range of products manufactured in developing countries changes during the process of development, and becomes more complex and technologically advanced.

The second type of spillover arises through increased productivity associated with improved infrastructure, a higher level of human capital associated with training and education, or applied R&D. We call this a ‘factor productivity spillover’. Of course, a side effect of increased productivity is that, in the restrictive context of fixed output, labour is shed and unemployment may rise. The prospect of such “jobless growth” is particularly challenging in economies where the recorded rate of unemployment as well as the rate of hidden unemployment are already high. Thus, the productivity spillover is a two-edged process: industry and market services become more productive and competitive, but labour demand is weakened if output growth remains weak. On the plus side, however, productivity is driven up, real incomes rise, and these effects cause knock-on multiplier and other benefits throughout the recipient economy. Whether the impacts are, on balance, employment creating or employment reducing has to be examined empirically using the HERMIN models. 23

How enduring are the beneficial output and productivity spillover effects likely to be? The infrastructure deficit in the recipient states is quite large, and the quality of infrastructure is unlikely to measure up to the level pertaining in the more developed donor states for many years. Because of this, and the fact that there are substantial returns to the elimination of congestion and other bottlenecks which will take some time to achieve, it is unlikely that diminishing returns to investments supported by the cohesion programmes will set in for the immediate future.

Turning to the evaluation of cohesion expenditure impacts, the dilemma facing policy analysts when they use macro models is that they cannot know precisely how appropriate the design of the policy is in addressing a country’s future development challenges. Nor

23 We are forced to ignore any interactions and complementarities that may exist between physical infrastructure, human capital and R&D, since so little is yet known about this aspect of cohesion policies. The interaction between physical infrastructure and human capital is potentially of great importance, and is at the centre of the optimality of the policy design.
can they anticipate how effectively the investment programmes will eventually be implemented (in the case of ex-ante evaluations). Even in the case of ex-post evaluations, policy design and implementation effectiveness are difficult to judge. At best, they can arrive at an informed qualitative judgement on the appropriateness of the cohesion programmes, drawing on any available monitoring and micro analyses. Information can also be drawn from economic theory, detailed quantitative knowledge of the economy being analysed, and examining the impacts of any previous investment programmes. The insistence by the European Commission that strict monitoring checks be observed helps towards more effective design and implementation, but cannot guarantee it.

During programme implementation, investment expenditures are a flow (the expenditure of x euro per year). But their cumulative impact brings about a long-lasting rise in stocks. For example, the stock of higher quality roads will increase. If these roads link up to each other, and serve to connect the main urban areas of a country, the economic “effectiveness” of the road stock also increases. Much the same applies to raising the “stock” of human capital, measured as the accumulated training and skill level of the national work force, and the “stock” of R&D, usually measured as the accumulation of expenditure on R&D activities.

It is these increases in the stocks of physical infrastructure, human capital and R&D that have the potential to generate spill-over benefits to the recipient economy, mainly in terms of increased output and higher productivity. The magnitude of these spillovers is unknown, but a range of values can be inferred from the international research literature discussed previously. Initially, we use average values drawn from international research, but later carry out a sensitivity analysis to explore the implications of assuming lower and higher values.

The impact analysis of the 2000-2006 cohesion expenditure programme on a specific recipient state can be executed by means of the following sequence of HERMIN model simulations:24

i. A simulation is carried out, starting in the year 1999 (the year before the programme for 2000-2006 was initiated), and continuing the simulation out to the year 2020, i.e., twelve years after the termination of the programme in 2008 (under the so-called “n+2” rule);25

ii. For the purposes of isolating the separate impacts of the 2000-2006 programme, the carry-over impacts of the previous 1994-1999 programme are ignored, as well as the continuation of cohesion expenditure beyond 2008 under the current 2007-2013 programme;26

iii. The 2000-2008 cohesion expenditures are then subtracted from the policy values used in stage (i), and the model is re-simulated. No other changes are made., and no

24 We assume that an “old” EU member state is being analysed. For a new EU member state, where the programme starts in 2004 and runs to 2008, the alterations to the sequence of simulations will be obvious.

25 In order to identify the full supply-side impacts that will continue after the termination of a cohesion expenditure programme, we have to simulate the models out far beyond the formal “termination” year of the programme being analyzed (i.e., the year 2008 for the programming period 2000-2006). We choose to continue the simulations out to the year 2020, i.e., twelve years after the effective termination of the 2000-2006 programme and, thus, sufficiently long for all demand-side impacts to have worked out. What the model-based analysis to be described in the next chapter will show is that although the implementation (or demand-side) impacts are large, these impacts vanish almost completely after the terminal year, 2008. The supply-side impacts, although more modest during the implementation period, endure for many years afterwards, due to the continued spillover benefits of the improved stocks of physical infrastructure, human capital and R&D.

26 In other words, we are examining the ex-post impact of the 2000-2006 cohesion expenditure in isolation, i.e., as a single programme implemented over the years 2000-2008, and discontinued thereafter. We return to this point in Chapter 4.
attempt is made to design a “substitute” domestically funded public investment programme that would have replaced a “missing” 2000-2008 cohesion expenditures. This is a very artificial assumption, since in the absence of EU-aided cohesion expenditures there almost certainly would have been a substitute domestically funded public investment programme, albeit perhaps smaller in magnitude;

iv. A common set of infrastructure, human capital and R&D spillover parameter values is assumed for the simulation at stage (iii), for each recipient country HERMIN model, selected from the middle of the range of values found in a survey of the international literature.27

v. It might be held that, in the absence of such large-scale cohesion policy shocks, the underlying structure of the recipient economies would have changed and that the use of HERMIN models calibrated with cohesion-inclusive data is invalid for the cohesion-exclusive simulation.28 However, HERMIN explicitly models the structural changes that are associated with the operation of cohesion expenditures, so the validity of this critique is weakened.

vi. The “without-cohesion expenditure” simulation results can be compared to the “with-cohesion expenditure” simulation results, and this is used to gauge the specific contribution of the policy. The impacts on all the variables in the HERMIN model can be quantified, including the impacts on aggregate GDP and total employment.

3.5. Recipient to donor state spillover mechanisms

Spillover links from the recipient states to the donor states can be examined in various ways, starting with simple approaches and moving towards more sophisticated approaches. The important point to emphasise is that in such an analysis we are keeping everything else fixed, except the responses of the recipient state economies to the implementation of cohesion expenditure programmes.

In addition, it should also be emphasised that although the recipient states trade with the donor states, in no case is any recipient state the largest, or even a very significant trading partner of any donor state. This can be illustrated in Table 5 by taking the top 13 trading partners of each of the donor states, and seeing where the recipient states are ranked

27 We can relax this assumption in a sensitivity analysis, where we can assume upper and lower bounds to the size of the spillovers, and are then in a position to relate our selections to qualitative information from national ex-post examinations.

28 This is referred to by economists as the “Lucas critique” of the use of econometric models to analyse policy impacts (Lucas, 1976). It asserts that certain kinds of models cannot be used to examine the effects of policy shocks, since the shocks alter the structure of the economies and invalidate the use of models built on “old” data.
Table 5: Donor state export shares with the cohesion recipient states in 2007: (per cent of national exports)

<table>
<thead>
<tr>
<th>Recipient state as importer</th>
<th>BE</th>
<th>DK</th>
<th>DE</th>
<th>FR</th>
<th>IT</th>
<th>LU</th>
<th>NL</th>
<th>AT</th>
<th>FI</th>
<th>SE</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>0.83</td>
<td>1.00</td>
<td>3.84</td>
<td>1.15</td>
<td>1.39</td>
<td>0.41</td>
<td>0.84</td>
<td>3.31</td>
<td>0.74</td>
<td>1.27</td>
<td>1.14</td>
</tr>
<tr>
<td>EE</td>
<td>0.04</td>
<td>0.32</td>
<td>0.06</td>
<td>0.06</td>
<td>0.03</td>
<td>0.00</td>
<td>0.08</td>
<td>0.03</td>
<td>2.38</td>
<td>0.79</td>
<td>0.09</td>
</tr>
<tr>
<td>EL</td>
<td>0.11</td>
<td>0.22</td>
<td>0.29</td>
<td>0.16</td>
<td>0.67</td>
<td>0.03</td>
<td>0.13</td>
<td>0.13</td>
<td>0.35</td>
<td>0.20</td>
<td>0.24</td>
</tr>
<tr>
<td>ES</td>
<td>2.09</td>
<td>1.99</td>
<td>3.02</td>
<td>8.29</td>
<td>5.48</td>
<td>0.83</td>
<td>2.18</td>
<td>1.17</td>
<td>1.55</td>
<td>1.56</td>
<td>3.88</td>
</tr>
<tr>
<td>IE</td>
<td>5.53</td>
<td>1.20</td>
<td>1.30</td>
<td>1.51</td>
<td>1.19</td>
<td>0.43</td>
<td>1.36</td>
<td>0.46</td>
<td>0.95</td>
<td>1.30</td>
<td>4.31</td>
</tr>
<tr>
<td>CY</td>
<td>0.04</td>
<td>0.02</td>
<td>0.08</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
<td>0.03</td>
<td>0.07</td>
<td>0.01</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>LV</td>
<td>0.02</td>
<td>0.39</td>
<td>0.07</td>
<td>0.04</td>
<td>0.02</td>
<td>0.00</td>
<td>0.06</td>
<td>0.03</td>
<td>0.40</td>
<td>0.46</td>
<td>0.23</td>
</tr>
<tr>
<td>LT</td>
<td>0.08</td>
<td>0.52</td>
<td>0.17</td>
<td>0.13</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
<td>0.04</td>
<td>0.24</td>
<td>0.38</td>
<td>0.11</td>
</tr>
<tr>
<td>HU</td>
<td>0.46</td>
<td>0.85</td>
<td>2.61</td>
<td>0.70</td>
<td>1.38</td>
<td>0.12</td>
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<td>2.63</td>
<td>0.58</td>
<td>0.75</td>
<td>0.91</td>
</tr>
<tr>
<td>MT</td>
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<td>0.01</td>
<td>0.05</td>
<td>0.07</td>
<td>0.06</td>
<td>0.00</td>
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<td>0.13</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>PL</td>
<td>0.99</td>
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<td>3.52</td>
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<td>2.23</td>
<td>0.54</td>
<td>1.23</td>
<td>1.43</td>
<td>1.26</td>
<td>3.09</td>
<td>1.41</td>
</tr>
<tr>
<td>PT</td>
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<td>0.60</td>
<td>1.06</td>
<td>0.52</td>
<td>0.17</td>
<td>0.42</td>
<td>0.20</td>
<td>0.38</td>
<td>0.46</td>
<td>0.56</td>
</tr>
<tr>
<td>SI</td>
<td>0.06</td>
<td>0.30</td>
<td>0.52</td>
<td>0.30</td>
<td>0.77</td>
<td>0.10</td>
<td>0.08</td>
<td>1.23</td>
<td>0.14</td>
<td>0.18</td>
<td>0.12</td>
</tr>
<tr>
<td>SK</td>
<td>0.24</td>
<td>0.52</td>
<td>1.30</td>
<td>0.43</td>
<td>0.90</td>
<td>0.07</td>
<td>0.44</td>
<td>2.11</td>
<td>0.30</td>
<td>0.43</td>
<td>0.49</td>
</tr>
<tr>
<td>BG</td>
<td>0.32</td>
<td>0.04</td>
<td>0.20</td>
<td>0.11</td>
<td>0.40</td>
<td>0.00</td>
<td>0.05</td>
<td>0.21</td>
<td>0.06</td>
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<td>0.09</td>
</tr>
<tr>
<td>RO</td>
<td>0.13</td>
<td>0.07</td>
<td>0.55</td>
<td>0.45</td>
<td>1.42</td>
<td>0.01</td>
<td>0.18</td>
<td>0.57</td>
<td>0.09</td>
<td>0.15</td>
<td>0.36</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11.35</strong></td>
<td><strong>10.53</strong></td>
<td><strong>18.16</strong></td>
<td><strong>15.96</strong></td>
<td><strong>16.57</strong></td>
<td><strong>2.86</strong></td>
<td><strong>7.80</strong></td>
<td><strong>13.62</strong></td>
<td><strong>9.55</strong></td>
<td><strong>11.09</strong></td>
<td><strong>14.07</strong></td>
</tr>
</tbody>
</table>

Taking the case of Germany as an example, what Table 5 says is that for the year 2007, the recipient states were the destination of 18.16 per cent of total German exports. The highest individual recipient state export market was the Czech Republic, which took 3.84 per cent of total German exports. The Polish share was next largest, at 3.52 per cent, and Spain third, at 3.02 per cent.

Conversely, we can explore the role played by the donor states in the economies of the recipient states by examining the top 13 trading partners of each recipient state, and seeing where the donor states are ranked (Table 6).
Table 6: Cohesion recipient state export shares with the donor states in 2007:
(per cent of total national exports)

<table>
<thead>
<tr>
<th>Donor state as export destination</th>
<th>CZ</th>
<th>EE</th>
<th>EL</th>
<th>ES</th>
<th>IE</th>
<th>CY</th>
<th>LV</th>
<th>LT</th>
<th>HU</th>
<th>MT</th>
<th>PL</th>
<th>PT</th>
<th>SI</th>
<th>SK</th>
<th>RO</th>
<th>BG</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE</td>
<td>3.02</td>
<td>1.11</td>
<td>2.00</td>
<td>3.51</td>
<td>8.09</td>
<td>2.36</td>
<td>1.08</td>
<td>1.95</td>
<td>1.70</td>
<td>0.90</td>
<td>2.97</td>
<td>3.04</td>
<td>1.01</td>
<td>2.24</td>
<td>1.86</td>
<td>7.56</td>
</tr>
<tr>
<td>DK</td>
<td>0.94</td>
<td>3.09</td>
<td>0.94</td>
<td>0.93</td>
<td>0.71</td>
<td>0.63</td>
<td>4.17</td>
<td>4.69</td>
<td>0.79</td>
<td>0.76</td>
<td>2.12</td>
<td>0.87</td>
<td>1.01</td>
<td>1.02</td>
<td>0.25</td>
<td>0.30</td>
</tr>
<tr>
<td>FR</td>
<td>5.70</td>
<td>1.50</td>
<td>5.19</td>
<td>23.16</td>
<td>6.39</td>
<td>1.29</td>
<td>1.64</td>
<td>4.23</td>
<td>5.19</td>
<td>17.06</td>
<td>6.74</td>
<td>14.80</td>
<td>6.84</td>
<td>7.05</td>
<td>9.00</td>
<td>4.87</td>
</tr>
<tr>
<td>IT</td>
<td>5.17</td>
<td>1.18</td>
<td>13.36</td>
<td>10.48</td>
<td>3.91</td>
<td>4.41</td>
<td>1.60</td>
<td>2.63</td>
<td>6.21</td>
<td>5.43</td>
<td>7.31</td>
<td>4.85</td>
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<td>6.67</td>
<td>19.87</td>
<td>12.45</td>
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<tr>
<td>LU</td>
<td>0.12</td>
<td>0.02</td>
<td>0.03</td>
<td>0.16</td>
<td>0.20</td>
<td>0.03</td>
<td>0.05</td>
<td>0.20</td>
<td>0.09</td>
<td>0.00</td>
<td>0.13</td>
<td>0.31</td>
<td>0.25</td>
<td>0.07</td>
<td>0.12</td>
<td>0.04</td>
</tr>
<tr>
<td>NL</td>
<td>3.83</td>
<td>2.99</td>
<td>2.51</td>
<td>4.02</td>
<td>4.33</td>
<td>2.45</td>
<td>2.21</td>
<td>3.47</td>
<td>3.18</td>
<td>0.74</td>
<td>4.23</td>
<td>4.00</td>
<td>1.77</td>
<td>3.75</td>
<td>2.40</td>
<td>1.46</td>
</tr>
<tr>
<td>AT</td>
<td>4.94</td>
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<td>1.06</td>
<td>0.96</td>
<td>0.63</td>
<td>0.72</td>
<td>0.59</td>
<td>0.49</td>
<td>5.02</td>
<td>0.34</td>
<td>2.08</td>
<td>0.61</td>
<td>8.59</td>
<td>6.08</td>
<td>2.99</td>
<td>2.25</td>
</tr>
<tr>
<td>FI</td>
<td>0.61</td>
<td>19.84</td>
<td>0.70</td>
<td>0.51</td>
<td>0.52</td>
<td>0.35</td>
<td>3.29</td>
<td>1.53</td>
<td>0.52</td>
<td>3.04</td>
<td>0.79</td>
<td>0.68</td>
<td>0.33</td>
<td>0.68</td>
<td>0.20</td>
<td>0.34</td>
</tr>
<tr>
<td>SE</td>
<td>1.86</td>
<td>14.67</td>
<td>1.28</td>
<td>1.17</td>
<td>1.24</td>
<td>1.14</td>
<td>8.11</td>
<td>4.39</td>
<td>1.21</td>
<td>0.49</td>
<td>3.56</td>
<td>1.44</td>
<td>0.96</td>
<td>1.58</td>
<td>0.75</td>
<td>0.73</td>
</tr>
<tr>
<td>UK</td>
<td>5.32</td>
<td>3.13</td>
<td>6.76</td>
<td>9.30</td>
<td>20.54</td>
<td>21.74</td>
<td>7.18</td>
<td>5.27</td>
<td>4.92</td>
<td>13.55</td>
<td>6.57</td>
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<td>59.86</td>
<td>60.88</td>
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<td>53.25</td>
<td>59.51</td>
<td>56.62</td>
<td>62.00</td>
<td>45.60</td>
</tr>
</tbody>
</table>
Taking Poland as an example in Table 5, we see that 65.15 per cent of total Polish exports had donor states as their destination. Of this total share, 28.64 per cent went to Germany, Poland’s dominant export market. Italy was next, at 7.31 per cent. France was third, at 6.74 per cent.

We can draw the conclusion that the donor states play a much more significant role in the economies of the recipient states than the recipient states do in the donor states. From the point of view of the larger donor states, we might describe the recipient states as almost “post-recursive”, by which we mean that influence flows mainly in one direction: from donor state economies to recipient state economies. To put it strongly, for the sake of emphasis, if Germany contracts, all of the recipient states are likely to be badly affected. But if any individual recipient state contracts, the impact on any of the donor states is likely to be quite modest.

As a consequence of their relatively small size compared to most of the donor states, measured in terms of relative size of GDP and their share of total donor state trade, the impacts of developments in the recipient states will impinge on the economies of the donor states through a rather narrow range of channels. The main channel will be trade, where any increased demand for imports by recipient states will spill over to the rest of the world economy, and a high proportion of the increased demand will be met by increased exports from the main donor states. The other possible channels of influence, such as through the labour market or monetary influences, can effectively be ignored when considered in the context of cohesion expenditure.

The different stages in the approach to examining the impact of cohesion expenditures on each of the donor states is set out in Figure 6. The total impacts on any donor state of all the recipient state effects is calculated by summing over all the recipient states.

There are four main stages in the analysis:

**Segment 1:** Evaluating the (negative) impact on the donor state of the costs of financing their net budget contribution to the EU.

The net EU budget contribution could be financed in many different ways: simply financing the contribution by creating debt; by cutting some element of public expenditure in the donor state by the amount of the budget contribution; by increasing some tax rate by enough to raise the required finance; or by a complex mixture of all these methods. In the simulations to be reported later in Chapter 5, we will use the rate of personal income tax to finance the budget contribution. Experiments showed that most methods of finance generate a similar negative response in the donor state.29

**Segment 2:** Evaluating the (positive) impact of cohesion expenditures on the recipient state.

This methodology has already been outlined above. The wider impact analysis on the recipient state is relevant to addressing the questions raised in Theme 2. The narrower focus on the impacts on recipient state total trade (imports, exports, and net trade balance) are relevant to addressing the questions raised in Theme 3.

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29 Financing by tax raising and expenditure reduction give almost identical responses. Debt financing generates a smaller short-term negative impact, but a similar long run impact if one forces the debt to return to the baseline value. If the HERMIN model incorporated forward-looking expectation mechanisms, all methods of finance would have similar negative impacts.
**Segment 3**: Allocation of increases in recipient state total import demand to individual donor states’ export supply.

In order to trace the impacts on the recipient economy’s changed demand for imports through to the countries that supply these imports, and the specific allocation to the donor states, we use the most recently published import share data (i.e., recipient economy imports broken down by the source country of the imports). In this way we can estimate how much of the change in a specific recipient country’s total imports, caused by cohesion expenditure, is likely to be supplied by an increase in a specific donor country’s exports.30

**Segment 4**: Analysis of the impact on GDP, employment and cash flows in a specific donor state economy of a change in the demand for imports by a specific recipient state.

This stage is carried out by simulating the donor state HERMIN model, where the changed in the imports of the recipient state, correctly allocated to a specific donor state, serves to boost manufacturing output directly, and the other sectors of the donor economy indirectly. The results of this simulation is then compared to the baseline simulation (where recipient state import demand is unchanged), and the knock-on consequences for the donor economy are evaluated.

**Segment 5**: Evaluating the net impact of cohesion expenditures on a donor state

This only requires the summation of all the recipient state positive trade impacts on each donor state, and the netting off of the (negative) impacts on the donor state of financing the budget contribution.

A more sophisticated methodology could be used to combine all recipient country macroeconomic models with macro models of the donor economies. In practice, the donor economies tend to be among the main trading partners of the beneficiary states. The recipient and donor trade-partner models could be simulated jointly, permitting the evaluation of a wide range of recipient/donor interactions in product and labour markets, as well as evaluating expenditure (including trade) and income effects. This approach would deepen the analysis of primary, bilateral direct impacts that was set out in Figure 6. It would permit the exploration of further rounds of impacts generated within the donor economies, as well as between donor and beneficiary economies as they respond to increased demand for their exports arising as a result of the implementation of cohesion expenditures in the recipient states. These could be referred to as the primary plus secondary impacts. In normal circumstances, the secondary impacts are likely to be positive. But initial experiments with the recipient and donor models indicated that the secondary effects were completely insignificant, so this approach was not continued.

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30 Over time trade shares can change. But this is usually a slow process. So the assumption that the latest trade shares remain fixed is a reasonable one.
3.6. Concluding remarks on methodology

The chain of logic of our evaluation starts with the division of member states into two groups: donors and recipients. At this starting point, a burden on the net donor states is caused by the need to finance the EU budgetary contribution by running higher taxation levels for the period of implementation of the programme than would otherwise be the case.

The European Commission then uses part of the budget to finance cohesion expenditure transfers to the poorer EU member states. These take the form of large scale public investment programmes of physical infrastructure, human resources and direct aid to firms.

31 We recall that our term "donor" refers to "net donor". All EU member states are, of course, "gross" donors in the sense of making budget contributions.
The primary goal of cohesion expenditure is to boost development in the recipient states and to accelerate the process of cohesion (or “real” convergence). During this process, the demand for imports by the beneficiary state rises, both due to the need to import capital goods and professional services as well as a consequence of the general boost to consumer demand caused by increased employment and incomes (as increased levels of investment spill over into higher household income).

An indirect spillover effect of cohesion expenditure on the donor states is to boost their exports, since the donor states are the main trading partners of the recipient EU member states. This demand boost feeds through the economies of the donor states and may serve to offset the initial negative impact of higher tax levels.

The already complex policy challenge is made even more complex by the fact that there is no solid consensus in the literature concerning any of the above stages. The international literature on the returns to public investment (of the cohesion expenditure kind) ranges from results showing high, modest, low, and even negative impacts. Different kinds of models are used to “embed” the cohesion expenditure investment mechanisms, and the appropriate structure of these models is disputed (see Bradley and Untiedt, 2008a for a recent survey of the issues).

No analysis of the present kind is going to produce a definitive resolution to all aspects of these complex research challenges. But a carefully structured investigation, where all stages are explained, examined critically, and empirical evidence is gathered, will serve to focus attention on areas where there is broad agreement and other areas where controversy reigns and debates will continue. This is particularly necessary in a situation where some of the most widely cited papers on the impact of Structural and Cohesion Funds arrive at highly negative conclusions that are often accepted uncritically (e.g., Ederveen et al, 2002 and 2006; Boldrin and Canova, 2001), even though their methodologies can be shown to be flawed (see Bradley and Untiedt, 2008b).
4. RECIPIENT STATE IMPACTS OF COHESION EXPENDITURE

KEY FINDINGS

• We present an impact analysis of the cohesion programmes in the recipient states for the period 2000-2006, identifying the effects of boosting output (GDP) and the effects on stimulating the demand for imports which is the main channel for impacts on donor states.

• We make a clear distinction between the demand-side impacts of cohesion expenditure during programme implementation, and the longer-lasting supply-side impacts that continue after the programmes are terminated.

• We show that the large implementational impacts are due to the Keynesian multiplier effects, but that these impacts quickly revert to zero after the programmes are completed (i.e., after 2008 in the case of the 2000-2006 programming period).

• We show the size of the enduring supply-side impacts, and discuss the trade-offs that exist between the need to boost output and employment in the recipient states, and the parallel need to raise the level of productivity.

• Using a sensitivity analysis, we show that the returns to well designed and effectively implemented cohesion expenditure programmes increases as the so-called “spillover parameters” increase. However, there is no way that the precise choice of these parameters can be finalised since research into the returns to cohesion expenditure programmes is still at an early stage.

4.1. Introductory remarks

In this chapter we describe the use of the system of HERMIN models to quantify the impacts of cohesion expenditure policy on the recipient member states designated as Objective 1. These states are as follows:

The “old” recipient states
• Greece, Ireland (only for 2000-2006 programme), Portugal and Spain

The “new” (2004) recipient states
• Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Cyprus and Malta

The “new” (2007) recipient states
• Bulgaria and Romania (only for 2007-2013 programme)
Our primary purpose is to present the analysis of the impacts on the recipient states of cohesion expenditure under the programming period 2000-2006, starting in the year 2000 for the four old recipient states and in the year 2004 for the ten new recipient states. In every case, the effective end-year of expenditure under the programme is 2008, since two extra years are added under the so-called “n+2” rule.

We have drawn attention to the fact that the current programming period is focused mainly on the twelve new member states, whose characteristics and trade orientation are quite different from those of the four old member states. Consequently, it is of interest to review the likely impacts of cohesion expenditure for the current as well as the immediately past programmes. To do so, we amalgamate the annual expenditures for both the 2000-2006 programme and the 2007-2013 programme, and analyse the impacts from the year 2000 to the effective terminal year of the current programme (i.e., 2015, invoking the “n+2” rule). The four old recipient states – Greece, Ireland, Portugal and Spain – received aid for the full period 2000-2008. Three of them (Greece, Portugal and Spain) will continue to receive significant aid during the 2007-2013 programme, with Ireland receiving only very small amounts of aid and effectively dropping out of the Objective 1 group.32 The ten new (2004) member states have received aid for the three last years of the most recent programme (2004-2006), continued to 2008 under “n+2”, and will continue to receive aid for the seven year period of the current 2007-2013 programme, continued to 2015 under the “n+2” rule. The two most recent new member states – Bulgaria and Romania – will receive aid only for the seven year period 2007-2013, continued to 2015 under the “n+2” rule. Since our analysis is mainly focused to the period from 2000-2006 the results shown in this Chapter focus to this period. The results are for the combined impact of the previous and actual programming period are shown in an appendix.

Data on the EC contribution to cohesion expenditure were supplied by DG-REGIO, and we have described in Chapter 2 how these data needed to be transformed for the purposes of economic impact analysis. The data were originally classified into various Operational Programmes (OPs), Measures and Projects within each OP. The task that we performed in Chapter 2 was to re-classify the OP/Measure/Project data into three “economic” categories: physical infrastructure; human resources (HR); and direct aid to the productive sector. Within the category “direct aid to the productive sector”, we distinguished between the use of funds to finance research and development (R&D) and other uses. We also derived the data for the domestic public co-finance contribution, using the statutory co-finance ratios taken from the two cohesion expenditure programmes that we wish to analyse. However, we ignore the further provision for “private” domestic co-finance.33

The responses of the recipient economies to cohesion expenditure over the two designated programming periods (2000-2006 and 2007-2013) need to be divided into two separate phases. First, there are the implementation years, i.e., the period during which the programmes are being set up and actually implemented. After the programme ends, the improved “stock” of physical infrastructure, the improved level of human resources (or “stock” of human capital), and the benefits of previous direct aid to support R&D (i.e., the enhanced “stock” of R&D) will continue to exert a beneficial influence on the economies.34

32 In the current programme for the period 2007-2013, the term “Objective 1” has been replaced by the term “Convergence criterion”. However, we continue to use the older terminology.

33 It should be stressed that the private co-finance contributions are an important part of any cohesion expenditure programme. But such inputs cannot be handled in the same way as we handle public policy instruments. In this study, we interpret the response of the private sector in the model simulations as encompassing the impacts of the private co-finance.

34 Of course depreciation of the “stocks” takes place over time, and these depreciation effects are incorporated into the models.
These influences operate solely on the supply side of the economy, separate from the expenditure impacts of programme implementation, through spillover mechanisms that serve to raise the level of production and of productivity, as was explained in Chapter 3.

Consequently, during the implementation years the impacts on the recipient economies will be made up of two separate, but inter-related processes:

a) A mainly demand-side impact, which is driven by the expenditures that implement the investment programmes. This will be manifested initially mainly through higher public investment and other increases in public expenditure, but will spill over into higher private consumption and investment, and will usually cause a deterioration in the trade balance (as imports are drawn in, prior to the supply-side improvements that will serve to generate increased output and exports). These are usually referred to as Keynesian “multiplier” impacts.

b) A mainly supply-side impact that arises from the gradual build-up of “stocks” of infrastructure, human capital and R&D, and the beneficial output and productivity spillovers that are generated both during and after any cohesion expenditure programmes.

The complexity of analysing the impacts of cohesion expenditure arises from the intermingling of these two separate processes, since in the real world they cannot be separately isolated and distinguished from each other. Only with a formal macro-sectoral model – such as HERMIN - is it possible to identify and quantify the separate demand and supply chains of causation.

In particular, if one confined the cohesion expenditure impact analysis to the implementation period of the 2000-2006 programme, the two separate processes would be very difficult to disentangle by simply observing the actual economic outturn. First, during the implementation period, 2000-2008, the gradual build-up of demand-side effects will initially dominate the outcome, and the improved supply side responses will tend to be small and hidden. Second, other non-cohesion policy factors would influence the performance of the economies of the recipient states in the past, and will continue to do so in the future (e.g., the Single European Market, foreign direct investment, the performance of a country’s trading partners, oil prices, etc.). In the model-based analysis of cohesion policy impacts, all other external and internal factors are assumed to be held unchanged. All that changes in this analysis are the cohesion expenditures.

These simulation results are designed to address two of the five macro-themes set out in contract terms, i.e.:

**Theme 2**: How do cohesion expenditure interventions influence the economic aggregates and the structure of the beneficiary economies? In particular, what part of the cohesion expenditure grants will be transformed into demand and production?

**Theme 3**: How big a share of cohesion expenditure interventions will leak to more prosperous regions via increased demand for imports from these regions? How are imports from donor states likely to evolve compared with the situation without structural funding.
4.2. Some technical assumptions made in the analysis

We start with a specially prepared “with-cohesion policy” baseline projection. For the years from 2000 to 2006, all economic data used in the HERMIN models are the historical values as published by EUROSTAT. For the years 2007 and 2008, the data are estimates based on the partial data that are published, and we use any available short-term forecasts. For years after 2009, we develop a medium- to long-term forecast (or scenario) using the HERMIN model and assumptions concerning the global economy and the domestic policy environment. We then re-simulate a “without-cohesion expenditure” scenario, by deleting all cohesion expenditures (EC and domestic public co-finance). The “with-cohesion expenditure” simulation baseline is then compared to the “without-cohesion expenditure” scenario, and the differences are taken as measures of the expenditure impacts. These differences are usually expressed as percentage changes relative to the baseline (e.g., for GDP impacts), but can also be expressed as absolute differences from the baseline (e.g., for unemployment numbers, the net trade balance, etc., where percentage deviations would not be appropriate).

A very important assumption – insofar as it affects the impact outturn – concerns the so-called spillover effects of cohesion expenditures on the recipient states. These are required in order to capture the benefits of the improving stocks of physical infrastructure, human capital and R&D in boosting output and productivity, gradually building up during the implementation stage and fully in effect after the completion of a cohesion policy programme (i.e., after the year 2008 for the 2000-2006 programme and after the year 2015 for the 2007-2013 programme).

On the basis of our examination of the international literature, previously reviewed in Chapter 3, and after reviewing some of the member state cohesion policy background documents, we have assumed the following “spillover” parameters as reasonable working hypotheses (Table 7).

Table 7: Standard spillover assumptions for cohesion expenditure simulations

<table>
<thead>
<tr>
<th></th>
<th>Manufacturing output</th>
<th>Manufacturing productivity</th>
<th>Market Services output</th>
<th>Market Services productivity</th>
</tr>
</thead>
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<tr>
<td>Physical infrastructure</td>
<td>20%</td>
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</tr>
<tr>
<td>Human resources</td>
<td>10%</td>
<td>10%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>R&amp;D (APS)</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>Zero spillover effect assumed</td>
</tr>
</tbody>
</table>

35 When the models were last updated, complete national accounting data were only available up to the year 2006, partial data were available for 2007, some data for 2008, and only short-term forecasts thereafter.

36 Such longer-term scenario analysis is not commonly carried out in any of the recipient states, except Ireland. The ESRI in Ireland has published a formal, model-based, five-year forecast, with an outline ten-year scenario, since the mid-1980s. Such an exercise is presently under way in Poland. No other country publishes forecasts in any detail for more than a couple of years forward.

37 The case of Malta is different, since it was only possible to construct a two-sector HERMIN-type model for that country, consisting of a private sector and a public sector. The private sector combines manufacturing, market services and agriculture (as defined in the five-sector HERMIN models). Average values for the spillover parameters (as between manufacturing and market services and shown in the above table) were used.
What this means, for example, is that a 1 per cent increase in the level of the stock of physical infrastructure brought about by cohesion expenditure will induce a long-run increase of 0.2 per cent in manufacturing output, 0.1 per cent in manufacturing productivity, 0.03 per cent in the output of market services and 0.03 per cent in the level of productivity in market services. Note that we take a conservative approach to the role of spillovers in market services compared to spillovers in manufacturing, as well as a very conservative approach to the role of R&D in creating spillover benefits. This latter view may change, and spillover assumptions be raised, as more information about the nature of the R&D programmes becomes available.\(^{38}\)

Since identical cohesion expenditure spillover mechanisms, as well as identical spillover parameters are assumed initially for all countries, the simulation outturns can only differ from country to country because the underlying HERMIN models have different properties. This will arise fairly naturally through the different sectoral structures in the recipient economies, the differing degrees of their openness to world trade, the different numerical parameter values in the HERMIN behavioural equations, etc.

If the cohesion expenditure programmes were to be implemented in each country in such a way that they were equally effective, then the simulations based on common spillover parameters would address the question: "what is the likely impact of cohesion programmes". But this is unlikely to be the case, and some countries can turn out to be better at designing and implementing effective investment programmes than others. This issue will be taken up later, when we examine sensitivity analysis.

A final technical assumption concerns the phasing-in of the spillover effects. We illustrate this by taking a specific example of physical infrastructure, namely road construction. While the road is being built, the demand-side (or expenditure) impacts are experienced. But the supply-side benefits will not come through immediately. Indeed, the disruption caused by extensive road construction may initially generate negative effects on the performance of the economy for a period. The positive effects will only come over time, as parts of the new road network are opened for use, and eventually when the completed road system is fully operational. To capture this phenomenon, we phase in the supply-side spillovers gradually over a period of five years, incrementing the benefits by one-fifth each year, with the full benefits of Table 7 only available after five years.\(^{39}\)

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\(^{38}\) Most of the empirical research on the impacts of R&D are based on US studies, and may be a poor guide to possible impacts in the relatively under-developed new member states of the EU. We took this into account by imposing lower values of the spillover elasticities. We note that DG-REGIO has recently issued a major call for tenders to carry out detailed research on this issue in all the recipient states.

\(^{39}\) Actual phasing in of supply-side spillover benefits are obviously more complicated than our simple assumption. But the longer-run impacts are not affected. The phasing in could be made more realistic in specific cases.
4.3. Recipient state impacts: Cohesion Expenditure Programme 2000-2006

4.3.1. The annual size of the injections

Common sense suggests that the cohesion expenditure impact on (say) GDP is likely to be closely related to the size of the injection of funds, measured as a percentage of GDP. Small injections of funds (measured as a percentage of GDP) are likely to produce small impacts on GDP, unless very unusual circumstances prevail.

Table 8 shows that the funding injections, expressed as a percentage of each country’s GDP, in the old member states (Greece, Ireland, Portugal and Spain), are relatively small. The Irish values are the lowest of the four, peaking at 0.46 per cent of GDP in 2002 for the separate EC contribution and at 1.03 per cent of GDP for the total EC and domestic public co-finance element. In the case of Spain, the total injection peaks at 1.59 per cent of GDP in 2002. The total injections for Portugal and Greece are still larger, and peak at 2.56 per cent in 2002 for Portugal, and at 3.21 per cent in 2007 for Greece.

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40 In this section we only report summary results for each recipient state. Very detailed results for each recipient state, for the separate programme periods 2000-2006 and the aggregate of programmes 2000-2006 and 2007-2013, are available on request.
### Table 8: Cohesion expenditure programme 2000-2006: annual injections

EU element (GECSFRAE) and including national co-financing (GECSFRAP), expressed as a per cent of GDP

<table>
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<tr>
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<td>1.54</td>
<td>2.16</td>
<td>0.52</td>
<td>1.36</td>
</tr>
</tbody>
</table>
The total (EC plus domestic public co-finance) injections for the ten new member states (joining in 2004) build up from low levels after 2004 and are in the region of 0.6 to 2.7 per cent of GDP by the end of the programming period. However, there are exceptions. Cyprus – a relatively wealthy country – has a low injection (peaking at under 0.24 per cent of GDP in 2007). Slovenia – another relatively wealthy country – also has a low injection (peaking at 0.52 per cent of GDP in 2007). In the case of Malta, the injection peaks at 0.65 per cent of GDP in the year 2007.  

A final observation is that the size of the funding injections, expressed as a percentage of ex-post GDP, will be influenced by the pattern of growth of GDP in the baseline (or “with-cohesion expenditure”) simulation, partially as a result of the funding impacts themselves. This may distort inter-country comparisons. The task of preparing detailed and authoritative long-term economic forecasts for all of the recipient states would be a major project by itself. Even the Commission’s forecasts for the new member states are sketchy beyond 2009.

**4.3.2. Cumulative size of the funding injections as a share of GDP**

Turning to Table 9, we see the different patterns of the cumulative injections of total funds (EC and domestic public contribution), where these are also expressed as a percentage of GDP. These range from the low values for Ireland (5.6%) and for Spain (9.8%). For Greece the cumulative peak by 2008 is 15.2%, and for Portugal the peak is 18.5%.

---

41 The long-term baseline growth forecast for Malta was very difficult to prepare, and is relatively low. This may serve to push up the funding injections, when expressed as a share of GDP.
### Table 9: Cohesion expenditure programme 2000-2006: cumulative injections
EU element plus national public co-financing, expressed as a per cent of GDP

<table>
<thead>
<tr>
<th>Year</th>
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<th>ES</th>
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The seven of the eight new member states which were formerly part of the COMECON bloc have broadly similar cumulative injections, in the range from just under 3% to about 7% of GDP. Slovenia (2%), together with Cyprus (0.8%) and Malta (1.9%) are the exceptions.

The size of the injections, accumulated in this way, gives an idea of the likely size of the total stimulus to the economy over the whole 2000-2006 programme period. If the programmes of investment had no supply-side spillover impacts, then we would be able to predict the likely impact on GDP once we knew the size of the appropriate “Keynesian” (or demand side) multipliers.42 For the smaller, more open EU member states, this would be usually in the region of unity. In other words, if the funds were used to pay for digging useless holes in the ground, and filling them in again (to use Keynes’ infamous example), then the impact on the economy would be about equal to the size of the funding injection, provided that the economy was operating at below full capacity.43 After the programme ended, there would be no sustained benefits, and the level of GDP would revert to its baseline value.

But even if the funds are used to support wise and productive investments, it is not the absolute size of the injection, expressed in millions of euro, that matters. Rather it is the size of the injection relative to the size of the recipient economy. The broadest measure of economic size is GDP. Other things being equal, we would expect bigger injections (expressed as a share of GDP) to have bigger impacts. As we will see, the models broadly confirm this, but also illustrate how the structure and dynamism of the recipient economies can influence the final outturn. For example, if an economy has a relatively small and unproductive manufacturing sector, and is not export oriented, the cohesion expenditure impacts are likely to be smaller than in the case of an economy with a dynamic, export-oriented manufacturing sector.44

4.3.3. The pattern of annual impacts on the level of GDP

Table 10 shows the annual impact of total cohesion expenditure (EC plus domestic co-finance) on GDP, expressed in terms of the percentage change in the level of GDP relative to the no-funds baseline value of the level of GDP. To take the example of the Czech Republic (CZ), Table 10 shows that the level of Czech GDP in the initial year of their programme (2004) increased by 0.36 per cent relative to the no-funds level of GDP in that year. The annual impact rises gradually as the programme is implemented, and peaks in the final year (2008) at a rise of 1.44 per cent relative to the no-funds baseline GDP for that year. We assume that all cohesion funding under programme 2000-2006 terminates in 2008. So in the first post-programme year (2009) the boost to GDP reduced from the peak of 1.44 per cent to a value of 0.60 per cent. By the end of the simulation period, the boost is down to 0.29 per cent. But it should be noted that all the increases in the level of GDP post-2008 arise purely due to the enduring spillover benefits of previous cohesion expenditure, and contain no demand-side implementation element.

42 Refer to Chapter 3 for an explanatory note on the concept of a Keynesian multiplier.

43 If the economy was operating at or near to full capacity, with full employment, then a demand-side cohesion expenditure boost would simply generate inflation.

44 A wider range of structural features of economies is captured in the HERMIN models, but cannot be comprehensively described in this report. More complete, technical information on the HERMIN system of models is available in Bradley and Untiedt, 2008b and 2009.
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It is important that the results presented in Table 10 be interpreted correctly. In the past, the long-enduring impacts of the cohesion policies on the level of GDP (as generated using the HERMIN and other models) have sometimes been confused with the more transitory impacts on the growth rate of GDP. HERMIN examines the impacts of the cohesion expenditure programmes on the level of GDP. Obviously, the cohesion policies serve to boost the GDP growth rate temporarily, relative to the growth rate of the “without-funding” case. But it would be unreasonable to build into HERMIN, or any other macro model, an assumption that a country’s growth rate could be permanently increased by a temporary programme of investment aid, even if the increase endures for nine or sixteen years.45 While the cohesion policies are being implemented and while the funding injection is increasing in magnitude, the growth rate moves higher than in the no-funding case. When the funding decreases, or when it is terminated, the negative demand shock initially drives the growth rate below the no-funding case. However, the overall effect is to leave the level of GDP higher than in the no-funding case, by an amount that varies from country to country. In the longer run, the growth rates in the no-funding and the with-funding policy regimes will converge and are likely to be identical.

A common pattern can be seen in the results presented in Table 10. The impacts on GDP during the implementation years (prior to 2008) are considerably higher than in the post-implementation years. But it should be stressed that a large impact on GDP does not necessarily imply efficient and/or effective use of cohesion expenditure resources. It might just arise from a large injection of funds working through the Keynesian multipliers in an economy that is still operating well below full capacity. Similarly, a small impact on GDP might just imply a correspondingly small injection of funds (e.g., the case of Ireland). Cross-country comparisons require us to develop a “normalised” measure of the impact, and this will be the cumulative multiplier in a later Table 12. We postpone international comparisons until then.

**4.3.4. The pattern of cumulative impacts on the level of GDP**

Table 11 shows the impacts of the total cohesion expenditure (EC plus domestic public co-funding) on the accumulated percentage rise in the level of GDP. This table is derived from Table 10 by accumulating the annual increases in the level of GDP for all previous years. As in the case of Table 10, these results cannot be compared between countries, nor can any inference be drawn that the larger impacts denote more efficient use of cohesion expenditure policies. Nevertheless, the individual results are interesting. Table 11 shows that, in the medium term, the cumulative increase in the level of GDP associated with the funds ranges from 1.8 per cent, in the case of Cyprus; 13 per cent in the case of Poland; to 17 respective 18 per cent in the cases of Estonia, Lithuania and Latvia.

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45 The kind of cumulative and enduring high growth of the kind experienced by Irish economy during the 1990s, as well as the high growth rates of some of the Baltic States in the early years of the present decade, are usually caused by a complex mixture of policies, including industrial policy to encourage clusters, the EU Single Market, convergence towards euro-zone low interest rates, as well as by cohesion expenditure policies. Indeed, the optimisation of the use of cohesion expenditure needs to consider the wider development strategy being implemented by a country.
### Table 11: Cumulative percentage increase in the level of GDP Cohesion expenditure for programme 2000-2006 (EU element plus national public co-financing)

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</tbody>
</table>

*Note: The table continues with data for subsequent years, not shown here.*
Consider the middle case of Poland, where the cumulative increases in the level of GDP by the year 2020 is 12.99%. We can interpret this result as follows. Let us assume (for the sake of exposition) that Poland grows at least as fast as the EU average in the no-funding case. In fact, based on recent experience, this is an extremely conservative assumption, since Poland, and all the other former COMECON new member states, have been growing much faster than the EU average in the recent past. But if this assumption of average EU rates of growth were true, it would imply that Poland would make no progress in catching up with the EU average (i.e., no real convergence). In other words, Poland would remain at roughly the same relative position within the EU in terms of GDP per capita.

One interpretation of Table 11 is that it suggests that the impact of the cohesion expenditure over the period 2004-2008 (assuming that they terminate after 2008) is to raise the cumulative level of GDP by almost 13 per cent in the case of Poland, over and above any underlying increases due to growth taking place in the no-funding scenario. But since we assumed (for sake of exposition) that Poland was growing at the EU average in the no-funding case, then this extra funding-induced rise in the level of GDP would permit an element of convergence to take place. Spreading the cumulative increase in GDP over the period 2004-2020 (i.e., the five years of significant cohesion expenditure programmes for 2004-2008, and for the twelve year period of zero funds to 2020), then the average sustained annual increase in the level of Polish GDP over and above the rest of the EU would be about 0.7 percentage points. On the basis of the crude assumptions that we made, this would be an estimate of the number of percentage points of cohesion that would be delivered annually by the 2004-2008 cohesion expenditure programme.

It is very artificial to separate the funding-induced boost to real convergence from all the other factors that might serve to promote convergence. But it does give a rough order of magnitude of the modest, but significant role that cohesion expenditure can play in isolation from these other driving forces.

4.3.5. The emerging pattern of cumulative multipliers

A useful way of presenting the impact results in a manner that permits cross-country comparisons is to calculate a so-called “cumulative” multiplier. This is defined as the cumulative percentage increase in the level of GDP divided by the cumulative funding injection, where the latter is expressed as a percentage of GDP. The results are presented in Table 12.47

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46 We use the term “real convergence” to signify convergence in the level of GDP per head. In the euro zone, “nominal convergence” refers to inflation, interest rates and public sector borrowing.

47 The ordinary definition of a public expenditure multiplier is the change in the level of GDP (relative to a baseline) divided by the change in public expenditure (also relative to a baseline). This is derived during the testing of the HERMIN models, in order to check the validity of the model structure. The size of the public expenditure multiplier is in the region of unity for small open economies, and rises above unity for the larger, less open economies. But cohesion expenditure programmes consist of simultaneous changes to many different policy instruments, so one has to define a different kind of multiplier.
Table 12: Cumulative cohesion expenditure multiplier for programming period 2000-2006

<table>
<thead>
<tr>
<th>Year</th>
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<th>CY</th>
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<td>0.86</td>
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<td></td>
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<td>2.53</td>
<td>2.57</td>
<td>2.20</td>
<td>2.81</td>
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Since the absolute level of GDP impacts shown in Tables 10 and 11 are now replaced by the “cumulative” multipliers shown in Table 12, one can now make inter-country comparisons of cohesion expenditure impacts. The size of the “cumulative” multiplier is no longer dependent on the absolute level of the funding injection. We can now say that countries with high cumulative multipliers are the ones that have probably made best use of the funding, in the sense of selecting projects that yield a high rate of return. In other words, both the Operational Programmes and the inherent structure of the economies, as reflected in the structure of their HERMIN models, together with any non-funding supportive policies, combine to produce high impacts on the level of GDP (or, equivalently, high transitory impacts on the growth rate of GDP).

Using Table 12, we can divide the recipient countries into three groups, based on a ranking by the size of the cumulative multipliers:

**High values (above 3.0):** IE (4.0), ES (3.3), CZ (3.3) and MT (3.1)

**Medium values (2.5 to 3.0):** SK (2.8), EL (2.8), EE (2.8), PT (2.6), PL (2.5)

**Low values (below 2.5):** LT (2.4), HU (2.4), SI (2.2), CY (2.2), LV (1.9)

Although such a classification is interesting, and can be interpreted in terms of the properties of the economies reflected in their individual HERMIN models, nevertheless it should not be over-interpreted. The properties of the HERMIN models, particularly for the new, former COMECON, member states, are not very robust, since their structures are still in a state of flux. In addition, it should be recalled that we have assumed a fixed, common pattern of spillover parameters across all recipient states, “new” and “old”. So, for example, we assume that the quality of economic development planning is the same in Ireland (on the one hand) as it is for Poland (on the other). But this assumption is forced on us by the absence of any authoritative, quantitative, independent evaluation of the capacity of individual recipient countries to plan and optimise their cohesion expenditure planning, and to implement the resulting investment projects in a timely and cost-effective manner.

Based on detailed knowledge and experience of all the “old” and “new” recipient states, we could develop impressions of the different standards of administrative capacity of the cohesion policy managing authorities, and the quality of the economic analysis that underlies the pre-cohesion expenditure planning. But if one wished to act on this kind of information, one would then alter the sizes of the so-called spillover parameters used in the various models (as set out in Table 7 above), since these capture the “quality” of the investments in terms of their likely ability to cause faster growth and produce a higher relative level of GDP per head. Higher values of the spillover parameters would result in higher values of the cumulative multipliers (or rates of return), other things being equal. However, we are reluctant to go down this route prior to there being a detailed and systematic examination of the country programmes at a micro-economic level. Consequently, any differences in the cumulative multipliers are only capturing the inherent “structural” differences between the economies of the recipient member states, as captured in the structural equations of the respective HERMIN models. They are not capturing differences in cohesion expenditure programme quality of design and effectiveness of implementation.

48 See Bradley, J., T. Mitze, E., Morgenroth and G. Untiedt (2006) for a description of how micro-analysis of cohesion expenditure programmes provide a guide towards selecting the appropriate size of the spillover parameters.
Some examples will serve to illustrate this point. Consider Ireland and Greece, where the HERMIN models capture some important stylised facts and differences between the economies. For example, the share of manufacturing in overall GDP in Ireland in 2000 was 33%, whereas it was only 11% in Greece. The annual rate of technical progress in Irish manufacturing is about 8 per cent per year, but only 3.4 per cent per year in the case of Greece. In addition, whereas the Irish economy is extremely open to world trade (as measured by export and import ratios to GDP), the Greek economy is the least open in the EU (based on these measures). In terms of wage bargaining mechanisms, a higher proportion of productivity in passed on to wages in the case of Greece than is the case in Ireland. These are the kind of structural differences that emerge from the HERMIN models, and serve to influence how the models respond to cohesion expenditure policies. In the cases of Ireland and Greece, the implication will be that the impact of cohesion policies on Greece, as measured by the cumulative multiplier, is likely to be lower than in the case of Ireland.

4.3.6. Sensitivity analysis

If we could base our choice of spillover parameters for each specific country model firmly on local research, then we could propose specific values that were appropriate to the conditions in specific countries. Unfortunately, such research is missing from the "old" recipient states (with the exception of Spain), and is also missing from all the “new” recipient states. Consequently, we are forced to fall back on the international literature, and make use of findings in a range of countries that have similarities with the beneficiary economies. For example, research based on the individual States of the USA can be used to gain insight into the likely spillover parameter values for small open economies on the EU periphery.

The international empirical literature, although vast, is somewhat ambiguous about the appropriate magnitude of the externalities. As we recounted in Chapter 3, different researchers use different methodologies, and arrive at different conclusions. Faced with this situation, there are two possible strategies. The first would be to wait until the research results are available in the recipient countries and to stand aside from any attempt to quantify the likely macroeconomic impacts of the policy interventions. The second would be to carry out the macroeconomic evaluation exercises using a range of spillover parameters and to exercise judgement on the most appropriate values for each country based on a wide range of information about the situation in each country.

For example, in the case of the earlier Irish cohesion expenditure programmes, there is a body of evidence that suggests that the ESF training schemes – as implemented by the Irish State Training Agency (FAS) - were reasonably well targeted, closely integrated with other economic development policies, and were reasonably effective (Honohan (ed.), 1997; Denny, Harmon and O’Connell (2000)). This would suggest using spillover parameters in the upper part of the international range. However, in the case of the Greek cohesion expenditure programmes of the 1990s, the limited information that we have on the extensive re-phasing of the 1994-1999 programme that had to be carried out, suggests that design and administrative difficulties may have arisen at the implementation stages of some of the earlier Greek Operational Programmes. This would suggest that lower values for the spillover parameters should be used.49 In both extreme cases, a sensitivity analysis

49 The use of low spillover parameters for the macroeconomic impact analysis is quite consistent with the existence of some highly effective Operational Programmes within an overall cohesion expenditure programme. However, in the aggregate, any extensive “re-programming” effects are very likely to hide the beneficial effects of the better programmes, so overall the use of low parameters is probably more appropriate.
needs to be carried out to explore how the impact changes as the three types of spillover mechanisms – with respect to physical infrastructure, human capital and R&D - are varied from low to high values. For this exercise, the numbers shown in Table 13 have been used.

### Table 13: Spillover parameters used in sensitivity analysis

<table>
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<tr>
<th>Factor productivity spillovers</th>
<th>0.00</th>
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<th>0.20</th>
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<td></td>
</tr>
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<td>0.00</td>
<td>Zero – Zero</td>
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</tr>
<tr>
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<td>Medium – Medium</td>
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</tr>
<tr>
<td>0.40</td>
<td>High - High</td>
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</tr>
</tbody>
</table>

It will be recalled that in the “standard” set of simulations reported earlier in Tables 10-12, the “medium-medium” combination of spillover parameters was used throughout the analysis, representing average international values. Consequently, differences between the country outcomes of the policies arise as a result of the different underlying macroeconomic structures and properties of the recipient economies, as captured in the HERMIN models.

If we use “zero - zero” spillover parameters, we can only capture the pure demand-side, or Keynesian, impacts of cohesion expenditures. Minor additional effects (e.g., through shifting relative prices) can arise, but they are dominated by the straightforward demand effects. We can anticipate what the model simulations will produce for this case. While the interventions are being implemented (i.e., while there are positive expenditure streams of investment programmes), there will be demand-side impacts, generated through standard Keynesian multiplier effects. But in the complete absence of “stock” effects (working through improved infrastructure, human capital and R&D), these demand-side impacts will rapidly return to zero after the programmes terminate.

In the case of the “high-high” combination, the longer-run supply-side effects become much more relevant, particularly over time as the stocks of physical infrastructure, human capital and R&D build up. Here we get the demand-side impacts while the interventions are being implemented, and this is accompanied by a gradual build up of supply-side impacts that continue even after the cohesion expenditure programme is terminated. Eventually, depreciation effects set in and the level of real activity in the economy will start converging back towards the original no-intervention baseline level of activity. But this is a long drawn out process, and will continue long after 2020, the terminal year of our simulations.

In Table 14 we illustrate the simulation results for all three stylised cohesion expenditure intervention scenarios, using Portugal as an example. These three “sensitivity” options are:

**a.** A “zero-zero” choice of spillover parameters for physical infrastructure, human capital and R&D;

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50 Compared to the findings taken from the empirical literature, our high spillover parameters sometimes fall into the middle of the observed scale, but we deliberately adopted a conservative definition of “high” spillover parameters.
b. A “medium-medium” option, where the spillover parameters are assumed to take values that are in the mid range of results found in the international literature; and
c. A “high-high” option, where the spillover parameters are assumed to take values that lie in the upper range of results found in the international literature.

Table 14: Portugal: Cohesion expenditure sensitivity analysis
Impacts on GDP and total employment (L)

<table>
<thead>
<tr>
<th>Year</th>
<th>ZERO-ZERO</th>
<th>MEDIUM-MEDIUM</th>
<th>HIGH-HIGH</th>
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<tr>
<td></td>
<td>GDP</td>
<td>L</td>
<td>GDP</td>
</tr>
<tr>
<td></td>
<td>% dev from base</td>
<td>% dev from base</td>
<td>% dev from base</td>
</tr>
<tr>
<td>1999</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2005</td>
<td>1.9</td>
<td>1.7</td>
<td>3.1</td>
</tr>
<tr>
<td>2008</td>
<td>2.1</td>
<td>1.9</td>
<td>3.8</td>
</tr>
<tr>
<td>2009</td>
<td>0.4</td>
<td>0.2</td>
<td>2.0</td>
</tr>
<tr>
<td>2010</td>
<td>0.3</td>
<td>0.2</td>
<td>1.8</td>
</tr>
<tr>
<td>2015</td>
<td>0.3</td>
<td>0.1</td>
<td>1.6</td>
</tr>
<tr>
<td>2020</td>
<td>0.2</td>
<td>0.1</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Moving from “zero-zero” to “medium-medium” and eventually to “high-high” combinations of spillover parameters produces very significant and increasingly large boosts to GDP and employment. Also, since the higher “stocks” of infrastructure, human capital and R&D continue to generate benefits after the programme terminates in 2008, the increase in the level of GDP (relative to the no-policy baseline) is sustained into the longer term, at 1.4 per cent for the “medium-medium” case, and 2.4 per cent in the “high-high” case. However, higher spillovers also imply higher productivity growth. Consequently, the boost to total employment is considerably less than the boost to GDP.

A broadly similar pattern of sensitivity analysis is repeated in all the other recipient states. The higher the assumed spillover parameters, the higher will be the sustained increase in the level of GDP and employment after the programmes terminate. But at the present state of knowledge, we cannot yet predict with any degree of confidence whether the spillovers will be high or low for any given recipient state in the context of any given programme. In the case of the “old” recipient states, at least we have many years of previous experience of designing and implementing cohesion expenditure programmes to draw upon (e.g., for the programming periods 1989-1993 and 1994-1999). But even then, we cannot be sure how much of real convergence in the old member states was due to the design and implementation of the cohesion expenditure programmes (i.e., associated with differing spillovers), rather than to other matters that may only be indirectly associated with the programmes (e.g., the Single Market, foreign direct investment, other purely domestic policies, etc.).

But what sensitivity analysis suggests is that there is a close relationship between the size of the spillover effects and the quality of programme design and implementation. It is very likely that a well-designed and efficiently implemented programme will be associated with high spillover parameters, and the international literature tends to confirm that connection.
The higher the spillover parameters, the larger the contribution to promoting convergence. But we have no precise, scientific way of ranking the present programmes in the recipient states in terms of quality of design and efficiency of implementation. That is why we have to continue to use the “standard” set of spillovers in our main simulations of impacts on the economies of the recipient states.

4.3.7. Theme 2 – Impacts on recipient state aggregates and structure

Based on the previous presentation of the impacts of the 2000-2006 programme on the economies of the recipient states, we have shown that these injections of funds are both large enough, and carefully targeted on stimulating accelerated development that they influence all aspects of the economies. But we drew a careful distinction between the implementation period (2000-2008 for the past programme, and 2007-2015 for the current programme) and the post-implementation period.

Economic theory, as incorporated into the HERMIN models of the recipient states, suggests that the main supply-side impacts of the programmes operate through the manufacturing and market service sectors, by driving up productivity and stimulating higher output directly. The productivity impacts are associated with improved infrastructure, higher levels of applied education and training, and the longer term benefits of R&D. The direct output effects are associated with the wider improved competitive environment, and the ability both to attract inward investment and retain and stimulate indigenous activity.

But, of course, while the programmes are being implemented, there will be a sizeable demand-side shock passing through the recipient economies. Since this is the most visible and dramatic element of the programmes – massive building projects, high profile training initiatives, well publicized investment incentives to firms – it is the one that attracts most attention. Indeed, when some recipient economies were already growing very fast – such as Ireland in the 1990s, and the Baltic States in the first half of this decade – the demand-side boosts during the implementation phases raised doubts as to the wisdom of cohesion expenditure policies in these circumstances.

But the structural transformation goal of the programmes plays an essential part in preparing the recipient economies to face the greater competitiveness of the Single European Market. Studies have shown that even in the Baltic States, the high growth of the early years of this decade served to conceal the problems on the production side of manufacturing, where many firms were of a traditional, labour intensive kind.51

The HERMIN simulations showed that the enduring impacts, after the termination of the programmes, was higher productivity mainly in manufacturing and market services. The instrument of the infrastructural programmes was the building sector, but the sustained boost to activity in this sector quickly vanishes once the programme terminates. The agriculture sector and the government sector remain largely unchanged, except for state-led training schemes and institutions associated with the ESF part of the programmes.

We illustrate this process for all of the recipient states in Figure 7, which consists of fourteen sets of four graphs per state, displaying the following results:

- Figure 7, Panel (a): EC-funded cohesion expenditure (as a per cent of GDP)

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51 Best and Bradley, 2006 provides a case study of Estonia, where it is asserted that rapid growth on the demand side tended to bypass the task of modernising the main exporting sectors.
Taking Estonia as an example, Figure 7, Panel (a) shows that the injection of EC-funded cohesion expenditure into the Estonian economy was 0.57 per cent of GDP in the start-up year, 2004, and rose gradually to 1.11 per cent of GDP by the final years. Panel (b) gives the impact of the cohesion expenditure on GDP, based on the HERMIN model simulation. In the initial year, the impact was only 0.6 per cent, i.e., the level of GDP was increased by 0.65 per cent above the baseline (no-policy) case. As the programme was progressively implemented, the impact on GDP increased, and peaked at 2.58 per cent in the final year, 2008. At that stage all cohesion expenditure is assumed to cease (remember, we are analysing the 2000-2006 programme in isolation from any other). With the cessation of funding, there is a sudden reduction in the boost to the level of GDP. But, due to supply-side spillovers, there are enduring benefits to GDP, albeit of smaller size. By the year 2015, i.e., seven years after the 2000-2006 programme expenditures were terminated, the boost to the level of GDP is still about 0.77 per cent. Panel (c) gives the impacts on total employment, and these are seen to follow the same profile as the impacts on GDP, but are about half the magnitude. Panel (d) refers to trade impacts, and are dealt with in the next section.
Figure 7: Cohesion expenditure programme 2000-2006: Impacts

a) Cyprus (CY)

b) Czech Republic (CZ)
Figure 7: Cohesion expenditure programme 2000-2006: Impacts (continued)

c) **Estonia (EE)**

- **a)** EU Cohesion Funding
- **b)** GDP Effect
- **c)** Employment Effect
- **d)** Net Trade Balance Effect

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d) **Greece (EL)**

- **a)** EU Cohesion Funding
- **b)** GDP Effect
- **c)** Employment Effect
- **d)** Net Trade Balance Effect

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Figure 7: Cohesion expenditure programme 2000-2006: Impacts (continued)

**e) Spain (ES)**

- **a) EU Cohesion Funding**
- **b) GDP Effect**
- **c) Employment Effect**
- **d) Net Trade Balance Effect**

**f) Hungary (HU)**

- **a) EU Cohesion Funding**
- **b) GDP Effect**
- **c) Employment Effect**
- **d) Net Trade Balance Effect**
Figure 7: Cohesion expenditure programme 2000-2006: Impacts (continued)

**g) Ireland (IE)**

- **a) EU Cohesion Funding**
- **b) GDP Effect**
- **c) Employment Effect**
- **d) Net Trade Balance Effect**

**h) Lithuania (LT)**

- **a) EU Cohesion Funding**
- **b) GDP Effect**
- **c) Employment Effect**
- **d) Net Trade Balance Effect**
Figure 7: Cohesion expenditure programme 2000-2006: Impacts (continued)

i) Latvia (LV)

- a) EU Cohesion Funding
- b) GDP Effect
- c) Employment Effect
- d) Net Trade Balance Effect

j) Malta (MT)

- a) EU Cohesion Funding
- b) GDP Effect
- c) Employment Effect
- d) Net Trade Balance Effect
Figure 7: Cohesion expenditure programme 2000-2006: Impacts (continued)

**k) Poland (PT)**

- **a) EU Cohesion Funding**
- **b) GDP Effect**
- **c) Employment Effect**
- **d) Net Trade Balance Effect**

**l) Portugal (PT)**

- **a) EU Cohesion Funding**
- **b) GDP Effect**
- **c) Employment Effect**
- **d) Net Trade Balance Effect**
Figure 7: Cohesion expenditure programme 2000-2006: Impacts (continued)

m) Slovenia (SI)

![Graphs for Slovenia (SI): EU Cohesion Funding, GDP Effect, Employment Effect, Net Trade Balance Effect.]

n) Slovakia (SK)

![Graphs for Slovakia (SK): EU Cohesion Funding, GDP Effect, Employment Effect, Net Trade Balance Effect.]

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4.3.8. **Theme 3 – Impacts on recipient state imports and donor state exports**

The simulations carried out with the *HERMIN* models showed that in every case, the net trade balance deteriorated as the cohesion expenditure programmes were implemented. However, this should not be interpreted as being the result of a consumer boost, induced by cohesion expenditure. We could simulate such a consumer boom simply by assuming that the spillover parameters associated with improved infrastructure, human capital and R&D were zero. In other words, the funds would be assumed to be spent on “make work”, that led to no improvements in the quality of infrastructure and human capital. Indeed, much the same result would be obtained if we put the amount of the cohesion expenditure through the models simply as income transfers to the household sector, and studied how they boosted private consumer expenditure. During such an induced consumer boom, we would also see a deterioration in the recipient country’s trade balance, as consumer imports were sucked in. But the effect would terminate immediately after the programme ended, leaving no longer-term benefits.

Of course, actual cohesion expenditure programmes involve investment projects that generate increased demands for producer capital goods (initially), and consumer goods, after the wages are spent by workers. The *HERMIN* simulations pick up the deterioration in the recipient country trade balance during implementation, where the funds help pay for the imports, and the resulting completed investment activities leave a long-enduring benefit in terms of more, and higher quality, roads and more productive, trained labour. After the programmes are terminated, the net trade balance in the recipient economies moves back into a surplus, when compared to the “no-funding” case. This distinction is important, since even in the post-programme period, most of the recipient economies will continue to run sizeable net trade deficits for some time to come. But the *HERMIN* simulations suggest that the improvements in the supply sides of manufacturing and market services are likely to sustain a higher rate of import demand from the larger, more developed donor states. In view of the rapid trade integration within the Single European Market, much of this future trade will be in producer goods, and intermediate products, and not just in final or consumer goods.

At present, this phenomenon shows up in the *HERMIN* simulations in the form of a sustained higher demand for the exports of the donor countries. Of course, as the recipient states develop, they will also be able to compete more effectively with the donor states. The *HERMIN* simulations suggest that this looks like becoming a mildly “positive-sum game”, where donor states and recipient states continue to gain. And as convergence takes place, at least at the national level, the balance between “net” donors and “net beneficiaries” will become more even.

We can illustrate this process using Estonia again as an example. From Figure 7, Panel (d) for Estonia, we see that the trade balance deteriorated by almost 0.8 percentage points (where the trade balance is expressed as a percentage of GDP). This deterioration continued and increased, reaching 1.2 per cent of GDP by the year 2007, and remaining high at 1 per cent of GDP in 2008. Immediately after the termination of the 2000-2006 programme at the end of 2008, the trade balance deterioration caused by the cohesion expenditure vanishes, and the improved supply potential of the economy means that there is a modest improvement in the trade balance of about 0.4 per cent of GDP in the post programme period. Much the same general pattern can be observed in all the other recipient states.
4.4. Conclusions on Cohesion Expenditure Impacts 2000-2006

In this chapter we have addressed two of the five macroeconomic themes of our report, namely how cohesion expenditure programmes impact on the recipient states and affect GDP, and how they cause a change in the demand for imports during the programme implementation phase over the years 2000-2008. These are “unobservable” effects, and can only be identified by making use of macroeconomic models of the recipient economies to simulate the policy impacts. We did this by subtracting a counterfactual “without-cohesion expenditure” simulation from a “with cohesion expenditure” simulation, to obtain the specific impacts of the expenditures on each economy.

It is mainly during the implementation period of the 2000-2006 programme that the cohesion expenditures serve to boost the demand for imports by the recipient states. As the funds are absorbed, demand in the recipient economy outstrips supply, and this appears as a deterioration of the balance of trade. Demand tends to react immediately, but it takes some time for the supply-side enhancing processes to work through, as the economy restructures. The main elements of this restructuring takes the form of increased capacity in manufacturing and market services, and higher productivity. The summary magnitudes for each recipient state were presented in Figure 7. A much more extensive analysis of the impacts, including treatment of the five production sectors that make up aggregate GDP, can be obtained directly from the model simulations, but are not reported here. However, they are available on request to any interested reader.

After the cohesion expenditures terminate at the end of 2008, the demand-side stimulus vanishes and only the longer-term supply side enhancement remains. These are the result of spillover benefits from the improved stocks of physical infrastructure, human resources and R&D that were funded during 2000-2008 by the flow of cohesion expenditures. Although these “stocks” depreciate slowly over time, their spillover benefits are long-lasting, if modest.

In this chapter we have analysed the impacts of the programming period 2000-2006, which continues to the end of 2008 under the so-called “n+2” rule. Of course, the programming period 2007-2013 started up in January, 2007, and overlapped the last two (“n+2”) years of the previous programming period. Cohesion expenditures under this current programme usually take up where the previous projects left off. In Annex 2 we present a summary of our analysis of the impacts of the two programming periods, 2000-2006 and 2007-2013, regarded essentially as a single cohesion expenditure programme that will run from 2000 to 2015. The pattern of impacts is very similar to those of the 2000-2006 programme that we analysed in this chapter. But the current programme is directed very specifically at the new member states, whose trade orientation towards donor states tends to be different from that of the old recipient states (Greece, Ireland, Portugal and Spain).
5. SPILLOVERS FROM RECIPIENT TO DONOR STATES: RESULTS AND SENSITIVITY ANALYSIS

KEY FINDINGS

In this chapter we present our quantification of the spillover benefits of cohesion expenditure programmes on the “net” donor states.

- We show that the negative impacts of having to finance the EU budget contribution by raising taxes above the level that would have applied in a “no policy” case, tend to off-set the smaller positive trade stimulation impacts emanating from the recipient states.

- We show that the impacts on donor states are comparatively small, since the size of the EU budget is also small compared to the size of typical member state budgets.

- We also show how some countries appear to benefit more than others, in terms of the net donor state impact. France, Italy and (to a lesser extent, the UK) show a mainly positive net impact. However, the Netherlands and Luxembourg experience the largest, albeit modest net negative impacts. All other net donor states lie between these extremes.

- We explain these differences in terms of the relative sizes of the EU budget contributions, and the different trade exposures of the donor states to the recipient states.

- We conclude that there are re-distributioanl effects associated with the support of cohesion expenditure programmes. This process does lead to a modest net transfer of resources from the donor states to the recipient states.

5.1. Introduction

In this chapter we use the HERMIN models of the recipient and donor states to address the questions raised in themes 1, 5 and 6 of the analysis, i.e.,

Theme 1: How much of economic growth in donor states can be attributed to cohesion expenditure interventions in the recipient states?

Theme 5: How many jobs in donor member states depend upon cohesion expenditure financial transfers?

Theme 6: What is the effect of cohesion expenditure transfers upon cash flows?

This analysis comes after a complex preparatory analysis of the impacts of cohesion expenditure of the recipient states, covered in the previous chapter. The reason for the complexity is that there are impacts on the recipient states that create the possibility of
positive feedbacks on the donor states that can partially alleviate the negative impacts on the donor states of providing the net EU budget contribution. If the recipient states were completely disconnected from the donor states, in the sense of having no trade or other links with the donors, then our task would be much simpler. All we would have to do is quantify the costs to the donor states of financing their EU budget contribution, in terms of reduced activity. We would not need any models of the recipient states, since what goes on in them would have no rearing on the performance of the donor states, other than the costs of financing the EU budget contribution.

Of course, the recipient and donor states do have close trading and other relations, as was shown in Tables 5 and 6 of Chapter 3. So the analysis of impacts on donor states must move beyond the costs of the budget contribution, and address the way in which the absorption of cohesion expenditures in the recipient states causes trade spillovers, which partially compensate the donors.

In this chapter we analyse the donor impacts for all eleven donor states. But we feel that the summary donor state impacts that we present may be more credible if we take the reader “behind the scenes” (so to speak), by first using the case of Germany, the largest donor country, to explain the component elements of the analysis. We do this in Section 5.2.

In Section 5.3 we present the overall results for all eleven donor states, for the cohesion expenditure programme 2000-2006. For ease of comparison between the donor states, we use a standard set of four mini-graphs for each of the eleven countries. These start with the size of the net budget contribution of the donor state, expressed as a percentage of donor state GDP. Since trade with the recipient states are a crucial link in the cohesion spillovers, we then show the percentage of total exports of the donor state that are destined for the individual recipient states. The final two mini-graphs show the net impact on GDP and total employment in the donor state, i.e., the impacts on GDP and employment of financing the budget contribution, net of any positive trade spillover as a result of increased trade with the recipient country bloc. In theory, the net impact could be positive or negative. In practice, we will see that it is predominantly negative, albeit quite small.

Our simulation methodology can, in principle, carry out a similar “donor impact” analysis for the combined cohesion expenditure programmes 2000-2006 and 2007-2013. We have already described the likely impacts of these combined programmes on the recipient states (see Annex 2 for details). But it is more difficult to set out the required data in order to carry over the analysis of impacts on the donor states for future years. However, we consider this an important question, for the reasons outlined in the introduction to our report, i.e., the significant differences between the “old” recipient states and the “new” recipient states in their stages of development, sectoral structures and performance, and external trade orientation. In Section 5.4 we present an illustration of the donor impacts of the combined programmes for the case of Germany. However, the analysis has to be based on assumptions that may bias the outcome, so it should not be over-interpreted. Similar analysis was carried out for the other donor states, and is available on request to the interested reader.

In conclusion, the donor impacts derived from the model simulations need to be interpreted carefully, in terms of the three relevant themes (1, 5 and 6), and we discuss the implications of our results for these three themes in Section 5.5.
5.2. Case study: impacts of programme 2000-2006 on Germany

The impacts of the 2000-2006 cohesion expenditure programme on Germany are now presented, where the stages of the process are artificially decomposed using the HERMIN model of Germany to construct the counter-factual intermediate stage outcomes. In practice, of course, all the following processes would be happening simultaneously. But we can use the German HERMIN model to consider each in turn, for illustrative purposes. When we will describe the donor impacts on each of the eleven states, these artificial stages will be hidden in the net outturns.

First, if Germany financed its net EU budget contribution simply by creating debt, then the major initial impact would be to increase the public sector deficit. Raising debt would, of course, trigger other mainly monetary reactions. But we ignore these as they would take us into complicated and contentious areas of economic analysis. The outcome is shown in Figure 8, where the increase in the public sector deficit caused by making the budgetary transfer to the EU is expressed as a percentage of GDP, ranging between 0.2 and 0.4 percentage for the period from 2000 to 2008.

**Figure 8: Germany: impact of EU budget transfer on public sector deficit**

![Chart showing the impact of EU budget transfer on public sector deficit in Germany from 1999 to 2009.]

However, we make the stronger assumption that the German budget contribution to the EU is financed by raising tax revenue to cover the contribution, so that the public sector deficit would remain broadly unchanged from the situation that would prevail if the EU budget contribution had been zero. Specifically, we select the rate of direct personal income tax, and increase it by just enough to finance the EU budget contribution. This can only be done approximately, as Figure 9 shows. The budget transfer is almost completely offset by the increase in revenue from direct personal income tax, due to a rise in the rate of direct tax.
Since the “net” EU budget contribution flows out through the current account of the balance of payments, it has no direct impact on activity within the German economy. In other words, it serves to increase the income and expenditure of the citizens of other EU countries, and not the income and expenditure of German citizens (i.e., not directly). But tax financing of the EU budget contribution causes activity and employment to decline in Germany, in the absence of any off-setting forces. In Figure 10 we show the impact on German GDP of raising the rate of direct tax by just enough to finance the EU budget contribution. This would be the total impact in the artificial situation mentioned in the introduction, i.e., where the recipient states had no economic links with Germany.

**Figure 10: Germany: Impact on GDP of tax-financing EU budget contribution**
However, there is an off-setting positive activity, that arises as a spillover from the cohesion expenditures in the recipient states, namely the boost to demand for exports from Germany, as was documented in Chapter 4. Whether, and to what extent, Germany is likely to benefit from these spillover effects depends on the likelihood that the increased demand for imports by the recipient states will lead to an increase in German exports. To quantify this, we use the German trade shares with the recipient states, which are shown in Figure 11 for the year 2007.

**Figure 11: Germany: Trade shares with recipient states**

These trade shares are used as weights to add together all the boosts to import demand in the recipient states, and to estimate the likely overall boost in demand for German exports. It was noted in Table 5 that just over 18 per cent of German exports go to the totality of recipient states.

In Figure 12 we show the “pure” spillover boost to Germany emanating from the weighted sum of increased import demand in all the recipient states. We describe this as “pure” in the sense that there is no offsetting negative impact associated with the German EU budget contribution. In effect, the beneficial shock to the German economy is the same as would be associated with a general improvement in the world trading environment.
Finally, in Figure 13 we show the “total” impact on German GDP and employment of cohesion expenditures, i.e., the sum of the negative impact of tax financing (Figure 10) and the positive “pure” trade spillover impact (Figure 12).

**Figure 13: “Total” spillover impact on Germany of GDP and Employment**

What this illustrates is that the budget contribution impacts immediately, starting in 2000, and imparts a negative shock to the German economy. The negative budget shock is fairly...
constant between 2000 and 2008, after which it is assumed to go to zero. This might seem an incorrect assumption, but remember that we are looking at the trade-offs between the budget contribution (negative) and possible spillovers from the recipient states (positive). So, our reasoning is that if we terminate the cohesion expenditure programme, logical consistency requires us to terminate the budget contribution in the context of our study.52

However, the positive spillover benefits associated with increased demand for German exports only comes slowly, as the impacts of the 2000-2006 programme build up. By the termination year, 2008, the overall negative impact on the level of German economy (as measured by GDP and employment) has fallen to less than 0.1 percentage points. Thereafter, there is a very small, positive impact.

5.3. Donor state impacts of the 2000-2006 programme

We described the German case in great detail, so as to illuminate the various stages of the analysis. We carried out the same kind of simulations for all eleven donor states. For simplicity of exposition, we generated a standard set of four mini-graphs for each donor state, as set out in the introduction. These are presented in Figure 14, country by country. Here, we summarise the results, and describe the main features.

The overall patterns of the analysis are clear. Some countries appear to suffer larger “net” negative shocks than others. The cases of the Netherlands and Luxembourg are singular, and out of line with the other nine donor states. In both cases, this arises as a result of higher budget contributions and lower spillover benefits from the recipient state boost to import demand.

In the case of Luxembourg, the high negative impacts on GDP and total employment are caused by a combination of two main factors. First, the budget contributions made by Luxembourg are the highest of all the donor states, when expressed as a percentage of its GDP (Panel (a)). Second, the trade exposure of Luxembourg to the recipient states is the lowest of all donor states. But it should be noted that although the impacts on GDP and employment are the largest of the donors, they are quite modest (less than half of one percent of GDP and less than one quarter of one per cent of employment).

In the case of the Netherlands, there is also a high budget contribution rate (expressed as a percentage of GDP), and also a relatively modest exposure to trade with the recipient states. This results in relatively high negative net impacts on Dutch GDP and employment, in the region of -0.6 and -0.4 per cent, on average.

52 If we were to include the spillover impacts of the 2007-2013 cohesion expenditures, then we would also have to include the German budgetary contributions made after the year 2008. We noted that there is a two-year overlap of the 2000-2006 and 2007-2013 programmes, caused by the “n+2” rule. Technically, we ought to include the first two years of cohesion expenditure from the 2007-2013 programme. When we analyse the combination of the two programmes (in section 5.4), we do so.
Figure 14: Total impacts on donor states

**a) Austria (AT)**

![Graph showing EU Budget Contribution for Austria](image)

![Graph showing Exports to recipient countries for Austria](image)

![Graph showing GDP Effect for Austria](image)

![Graph showing Employment Effect for Austria](image)

**b) Belgium (BE)**

![Graph showing EU Budget Contribution for Belgium](image)

![Graph showing Exports to recipient countries for Belgium](image)

![Graph showing GDP Effect for Belgium](image)

![Graph showing Employment Effect for Belgium](image)
Figure 14: Total impacts on donor states (Continued)

c) Germany (DE)

- Graphs showing the impacts on Germany (DE) over a period of years, with categories for EU Budget Contribution, Exports to recipient countries, GDP Effect, and Employment Effect.

d) Denmark (DK)

- Graphs showing the impacts on Denmark (DK) over a period of years, with similar categories as Germany (DE).
Figure 14: Total impacts on donor states (Continued)

e) Finland (FI)

![Diagram showing EU Budget Contribution for Finland (FI) from 1998 to 2015.](chart)

-0.25 -0.15 -0.05 0.05 0.15 0.25 0.35 0.45 0.55 0.65 0.75

-0.20 -0.15 -0.10 -0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30

a) EU Budget Contribution

![Diagram showing Exports to recipient countries 2007 for Finland (FI) from 1998 to 2015.](chart)


% of GDP

b) Exports to recipient countries 2007

c) GDP Effect

d) Employment Effect

f) France (FR)

![Diagram showing EU Budget Contribution for France (FR) from 1998 to 2015.](chart)

-0.040 -0.020 0.000 0.020 0.040 0.060 0.080

-0.10 -0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40

a) EU Budget Contribution

![Diagram showing Exports to recipient countries 2007 for France (FR) from 1998 to 2015.](chart)


% over baseline

b) Exports to recipient countries 2007

c) GDP Effect

d) Employment Effect
Figure 14: Total impacts on donor states (Continued)

**g) Italy (IT)**

![Graphs showing the economic return of cohesion expenditure for Italy (IT).](image)

**h) Luxemburg (LU)**

![Graphs showing the economic return of cohesion expenditure for Luxemburg (LU).](image)
Figure 14: Total impacts on donor states (Continued)

i) Netherlands (NL)

a) EU Budget Contribution

b) Exports to recipient countries 2007

c) GDP Effect

d) Employment Effect

j) Sweden (SE)

a) EU Budget Contribution

b) Exports to recipient countries 2007

c) GDP Effect

d) Employment Effect
At the other extreme to the Netherlands and Luxembourg, France is the donor state that benefits most in terms of the impact on its GDP and employment. This is due to the combination of a relatively small budget contribution (when expressed as a percentage of its GDP), and a very high trade exposure to Spain, which received the largest share of cohesion expenditure, and where the returns to these expenditures (measured by the cumulative multipliers) were among the highest of all recipient states. However, although the GDP and employment impacts are positive, they are very small (+0.05 per cent for GDP and 0.035 per cent for employment, on average).

The United Kingdom is like France, in having a mainly positive impact on its GDP, particularly after the initial year, 2000, when its budget contribution rate (expressed as a percentage of GDP) declined. In this case, the high trade exposure to Spain and Ireland served to boost the net returns, since these two recipient states had the highest returns from cohesion spending, as measured by their cumulative multipliers.

All the remaining donor states fall into intermediate positions. Their net budget contributions lie between the high values of the Netherlands and Luxembourg, on the one hand, and the low values of France and the United Kingdom, on the other. Their trade exposure to the recipient states are also in the intermediate range, from a low of 10 per cent of total trade, in the case of Finland, to a high of 18 per cent of total trade, in the case of Germany. In all cases, the impacts on GDP and employment are negative during the period 2000-2008, when budget contributions are being made, and then become modestly
positive after 2008, when budgetary contributions are set to zero, but the long-term boost to trade continues.

5.4. Impacts of the 2000-2006 and 2007-2013 programmes: Germany

For the cohesion expenditure programme 2000-2006 we have almost complete data on the expenditures themselves, as well as national accounting data on both the recipient state and donor state economies. However, for the programme 2007-2013 we have to operate in a period where the only data available on programme expenditures relates to “planned” rather than “actual” expenditures, and the budget contribution data is not available. The HERMIN models have to be used both to generate the “with-cohesion expenditure” baselines, and the “without-cohesion expenditure” counter-factuals.

Nevertheless, the HERMIN model can be used to investigate the combined implementation of the 2000-2006 and the 2007-2013 programmes. We do this by defining a baseline projection out to 2020, i.e., five years after the effective termination of programme 2007-2013, and then simulating the back-to-back implementation of both programmes. The impacts on the recipient states has already been described in the Annex 2 to Chapter 4.

When it comes to examining the consequences for the donor states, we have to assume that the net budget contributions will remain broadly in line with the previous contributions, expressed as a share of donor state GDP. We also have to assume that rates of direct taxation will be broadly unchanged from their 2007 values, and that the budget contribution will be financed by raising direct taxation.

We present the simulation results only for the case of Germany, since they are very tentative and exploratory. In contrast to the 2000-2006 programme, the current 2007-2013 funding has been devoted mainly to the twelve new member states, and greater sums are being made available through their full participation for all nine years of the current programme. The current programme is simulated as operating it back-to-back with the 2000-2006 programme.

The results of tax-financing the extended 2000-2015 net EU budget contribution for Germany in order to fund the transfer to the EC is shown in Figure 15.

53 The situation with respect to data is not quite as good as it might appear. For example, in late 2008 when the models were constructed (the eleven donor state HERMIN models) or updated (the sixteen recipient state HERMIN models), EUROSTAT national accounting data for the period up to 2006 were available. In the case of the cohesion expenditures, we have already drawn attention to the fact that complete data are still not available. Indeed, some expenditures are still being completed, even though the “n+2” period ended on December 31st, 2008.

54 There is a compelling economic logic to combining cohesion expenditure programmes and linking them over time. However, the European Commission, for its own reasons of programme accountability, evaluates each programming period as a completely separate task. From an economic policy viewpoint, one should consider the programmes 1989-1993, 1994-1999, 2000-2006 and 2007-2013 as a single sequence of policy actions that evolved over time, rather than as four completely separate programmes.
Figure 15: Germany: EU budget transfer combined with tax financing: 2000-2015

Figure 16 shows the “pure” trade spillover impact on Germany, i.e., the impact of the benefits of cohesion expenditure-induced demand for German exports, but neglecting any off-setting impacts of financing the German EU budget contribution.

Figure 16: “Pure” spillover impact on Germany: 2000-2015 programmes

Finally, Figure 17 shows the total impact on Germany, where the costs of financing the budget contribution (by raising the rate of income tax) are seen to be greater than the benefits of extra trade during the years 2000-2007, but thereafter the impacts turn
positive. It will be recalled that budget contributions are made for all the years 2000-2015, but are terminated after 2015. This accounts for the extra boost to the level of GDP and employment after 2015.

It is interesting to compare the results of Figure 13 with Figure 17. In the case of Figure 13, the net impacts on German GDP were negative during the period 2000-2008, and only became modestly positive thereafter, when the budget contributions were switched off. In the case of Figure 17, the impacts for the period 2009 onwards remain positive, even though Germany has to make budget contributions between 2009 and 2015. The main reason is the much larger impacts on the recipient states (see Annex 4), and the fact that Germany has the highest trade exposure to the recipient states among all the donor states.

Figure 17: “Total” spillover impact on Germany: 2000-2015 programmes

5.5. Interpreting the donor impacts

We are required to address three themes with respect to impacts of cohesion expenditure on donor states. Based on the simulation results presented in Sections 5.1 to 5.4, we examine each theme separately. These are as follows:

Theme 1: How much of economic growth in donor states can be attributed to cohesion expenditure interventions in the recipient states?

The first point to make here is that any spillover impact of cohesion expenditures on donor state economies will be transitory, at best. Our analysis of impacts on the recipient states, as reported in Chapter 4, shows that there is a medium-term impact on the level of activity of the recipient states (i.e., GDP, employment, productivity, etc.), but no long-term impact on the growth rate of the recipient states. Consequently, any spillovers from recipient states will also produce medium-term level rather than growth impacts on the donor states.
Of course as GDP in a recipient state economy is boosted from a lower to a higher level, there will be transitory growth impact. But in the medium-term (i.e., after the programmes are terminated), the rate of growth in the “with-cohesion expenditure” case will be identical to the rate of growth in the “without-expenditure” case. It should be recalled that the EU “cohesion” objective is formulated in terms of the level of GDP per head, and not in terms of growth rates!

Our HERMIN-based simulations suggest that in the early years of the cohesion expenditure programmes, there are positive impacts of trade-boosting spillovers from recipient states to donor states. However, these are more than off-set by the negative impact on the donor economies of having to finance the budget contribution by raising taxes. In our simulations we financed the EU budget contribution in the donor states by raising a tax rate. We could also have reduced public expenditure in the donor state by just enough to fund the budget contribution. The negative economic impacts on the donor economy are broadly similar in both cases.

The country by country graphs presented in Figure 14 permitted us to examine exactly how GDP and employment in the donor states are affected. We saw that some donor states benefit from the indirect spillovers more than others. For example, France, the United Kingdom and Italy suffered no significant negative growth or employment impacts over the 2000-2006 cohesion expenditure programme, either during implementation (when they had to make net budget contributions) or after implementation (when we terminated the budget contribution).

The Netherlands and Luxembourg, on the other hand, experienced negative impacts on GDP and employment during the period 2000 to 2008, when they are assumed to be making net contributions to the EU budget. This was due to a mixture of the size of the budget contribution, the structure of these two economies, and the trade orientation to the main recipient states in Eastern and Southern Europe. But even in the case of the Netherlands, where the negative impact on GDP was largest, the level of GDP was only reduced at most by about 0.8 of one percentage point.

Theme 5: How many jobs in donor member states depend upon cohesion expenditure financial transfers?

The question of job dependency in donor states and its association with cohesion expenditure programmes has to be addressed very carefully. One must make the distinction between total employment numbers in the donor state economy, or in certain sectors of the economy, and specific employment in work that is associated with sectors which are involved in trade with the recipient states. Thus, even in the case of the Netherlands, where the overall impact on total employment was seen to be negative (see Figure 14, Panel (d)), there are still likely to be specific jobs that are dependent on the cohesion expenditure spillovers into the Netherlands. Nevertheless, the overall impact is negative. The results for the Netherlands presented in Figure 14, Panel (d) were in the form of the percentage differences between the “with policy” and “without policy” simulations. In Figure 18 below, we show the employment impacts in terms of actual numbers of jobs. For the years 2000-2008, the average jobs lost in the Netherlands due to the net burden of financing cohesion expenditure activities is in the region of 40,000, but after 2008 this becomes a modest net gain of about 5,000 jobs.
Indeed, even in the case of France, where the overall impact of the cohesion expenditure spillovers and the budget financing requirement on total numbers employed was positive (Figure 14, Panel (d)), there are possibly some jobs that are threatened by trade with the recipient states, and some jobs that are negatively affected by the need to raise the rate of personal income tax in order to fund the EU budget contribution. In Figure 19 we show the number of jobs gained in France. For the implementation years 2000-2008, this amounts to about 15,000 jobs per year. After 2008, the net gain in employment is reduced to about 6,000 per year.

**Theme 6:** What is the effect of cohesion expenditure transfers upon cash flows?

We interpret this theme as applying to three specific measures: the net trade balance; public sector financial balances; and profits in the corporate sector. Figure 20 shows the
total impacts of the cohesion expenditure programme 2000-2006 on all donor states. The impact on the net trade balance is expressed as a percentage of GDP. The impact on the government’s borrowing requirement is also expressed as a percentage of GDP. The impact on corporate sector profits is expressed as a percentage change from the no-policy baseline.

Taking the case of Germany as an example, the impact of cohesion expenditures (i.e., the net impact of financing the budget contribution and the trade spillovers from the recipient states) on the German net trade balance is uniformly positive, but it is only boosted by a maximum of 0.2 percent of GDP (in 2004). The impacts on the public finances are also small, and show that the government borrowing requirement, expressed as a percentage of GDP, increased slightly for the years 2000 to 2008, and fell slightly thereafter (both relative to the no-policy baseline). The biggest increase was recorded in the year 2003, but was only 0.1 percentage points. Finally, corporate profits fell slightly during 2000-2008, and improved thereafter. Given the small size of these effects, it is difficult to draw any firm and robust conclusions with respect to theme 6, other than to state that the impacts on cash flows are very minor, and probably well within any margin of error surrounding the structure and operation of the HERMIN models. Similar conclusions apply to all the other ten donor states.
Figure 20: Impact of Donor States: Cash flows

a) **Austria (AT)**

![Graph](image)

- a) Net Trade Balance Effect
- b) Public Sector Borrow Requirement
- c) Corporate Profits

b) **Belgium (BE)**

![Graph](image)

- a) Net Trade Balance Effect
- b) Public Sector Borrow Requirement
- c) Corporate Profits
Figure 20: Impacts on donor states: cash flows ( Continued )

c) Germany (DE)

![Graph showing impacts on Germany (DE)]

- a) Net Trade Balance Effect
- b) Public Sector Borrow Requirement
- c) Corporate Profits


d) Denmark (DK)

![Graph showing impacts on Denmark (DK)]

- a) Net Trade Balance Effect
- b) Public Sector Borrow Requirement
- c) Corporate Profits
Figure 20: Impacts on donor states: cash flows (Continued)

**e) Finland (FI)**

- a) Net Trade Balance Effect
- b) Public Sector Borrow Requirement
- c) Corporate Profits

**f) France (FR)**

- a) Net Trade Balance Effect
- b) Public Sector Borrow Requirement
- c) Corporate Profits
Figure 20: Impacts on donor states: cash flows (Continued)

**g) Italy (IT)**

![Graph showing impacts on Italy (IT)](image1)

**h) Luxemburg (LU)**

![Graph showing impacts on Luxemburg (LU)](image2)
Figure 20: Impacts on donor states: cash flows (Continued)

**i) Netherlands (NL)**

- **Net Trade Balance Effect**
  - 1999: -1.6
  - 2001: -1.4
  - 2003: -1.2
  - 2005: -1.0
  - 2007: -0.8
  - 2009: -0.6
  - 2011: -0.4
  - 2013: -0.2
  - 2015: 0.0

- **Public Sector Borrow Requirement**
  - 1999: -0.1
  - 2001: 0.0
  - 2003: 0.1
  - 2005: 0.2
  - 2007: 0.3
  - 2009: 0.4
  - 2011: 0.5
  - 2013: 0.6
  - 2015: 0.7

- **Corporate Profits**
  - 1999: -0.05
  - 2001: 0.0
  - 2003: 0.05
  - 2005: 0.1
  - 2007: 0.15
  - 2009: 0.2
  - 2011: 0.25
  - 2013: 0.3
  - 2015: 0.35

**j) Sweden (SE)**

- **Net Trade Balance Effect**
  - 1999: -0.4
  - 2001: -0.35
  - 2003: -0.3
  - 2005: -0.25
  - 2007: -0.2
  - 2009: -0.15
  - 2011: -0.1
  - 2013: 0.0
  - 2015: 0.05

- **Public Sector Borrow Requirement**
  - 1999: -0.05
  - 2001: 0.0
  - 2003: 0.05
  - 2005: 0.1
  - 2007: 0.15
  - 2009: 0.2
  - 2011: 0.25
  - 2013: 0.3
  - 2015: 0.35

- **Corporate Profits**
  - 1999: 0.0
  - 2001: 0.02
  - 2003: 0.04
  - 2005: 0.06
  - 2007: 0.08
  - 2009: 0.1
  - 2011: 0.12
  - 2013: 0.14
  - 2015: 0.16
Figure 20: Impacts on donor states: cash flows (Continued)

k) United Kingdom (UK)

a) Net Trade Balance Effect

b) Public Sector Borrow Requirement

c) Corporate Profits
5.6. Summary and conclusions

In this chapter we have brought together all of the elements of the schema originally set out in Figure 5 of Chapter 3 for the analysis of the impacts of cohesion expenditure on the donor states. The donor states are required to finance their net contribution to the EU budget by raising extra tax revenue domestically. We choose to use the rate of personal income tax, but any other tax rise would produce similar effects in the donor state. This has an immediate negative impact on the donor state economy, the exact magnitude of which will depend on the size of the net budget contribution.

The European Commission then allocates some of the total EU budgetary resources to support cohesion expenditure programmes in the so-called “recipient” states. The resulting programmes of investment activities stimulate the recipient state economies. In particular, during the implementation phase of the programmes (i.e., the years 2000-2008), the demand for imports is stimulated, and the net trade balance deteriorates.

To the extent that the donor states are suppliers of exports to the recipient states, export demand is stimulated in the donor states, and this alone will boost GDP. The net benefit to donor states will be the sum of the negative impact of the budget contribution and the positive impact of the trade spillovers from the recipient states. In two of the donor states – France and the United Kingdom – this net impact on GDP and employment is mainly positive for all implementation and post-implementation years. However, its magnitude is quite modest. In the cases of the Netherlands and Luxembourg, the net impact on GDP and employment is negative during the implementation years (2000-2008), and the highest of all the donor states. However, the net impact turns positive in the post-implementation years. All the other donor states experience the same pattern, but with much smaller impacts.

We can conclude that in the cases of nine of the donor states (i.e., excluding France and the United Kingdom), the cost of supporting cohesion expenditure programmes in the recipient states represents a small burden in terms of loss of GDP and employment, a slightly higher public sector borrowing requirement and lower corporate profits during the implementation years 2000-2008, but a slightly improved balance of trade. In the post-implementation years, 2008 onwards, these impacts all turn positive, but are of small magnitude. So there are redistributional effects associated with the support of cohesion expenditure programmes. This process does lead to a modest transfer of resources from the donor states to the recipient states.
6. MICROECONOMIC ASPECTS OF NET DONOR STATE BENEFITS

KEY FINDINGS

- To be able to answer the question: “What share of major public procurement contracts were awarded to enterprises from donor states?” requires access to data concerning on individual contractors and their country of origin.

- Investigations at the level of the Commission, at the national and even at the regional level, showed that data on individual contractors are not recorded or published.

- Improvements in data collection in the current programming period, 2007-2013, have only partially addressed this lack of data.

- One reason for lack of data is that the individual contractors are not regarded as beneficiaries of the EU cohesion expenditure, and that all contracts are awarded by many different levels of national and local administrations.

- But even knowing the nationality of main contractors would give very little information on the likely financial benefits to the country of origin. Analysis of all the sub-contracting activities need to be taken into account, where many of them are likely to come from the recipient state where the project is being implemented.

- This unsatisfactory situation needs to be addressed by more systematic data collection at the project level, both as part of project cost-benefit analysis, and to identify the firms who ultimately benefit from projects funded by cohesion expenditure.

6.1. Introductory remarks

In the previous chapters of our report we examined the five macroeconomic themes associated with the spillover impacts of cohesion expenditure programmes. These involved macro impacts on the recipient economies (Themes 2 and 3) as well as macro spillover impacts on the donor states (Themes 1, 5 and 6). In this chapter we address the issues raised in the single micro economic theme:

Theme 4: What is the percentage of contractors from donor member states that have been awarded major public procurement contracts funded partly by cohesion expenditure?

The previous analysis of the macro impacts of cohesion programmes took place, by definition, at a very high level of aggregation. All the individual projects and the measures that made up the Operational Programmes in each recipient state were reclassified into the three economic investment categories: physical infrastructure, human resources and direct
aid to private firms. Within any recipient state, the nationality of the contractors who were selected to carry out the project work was unknown and irrelevant. When it came to examining the spillovers from the recipient states to the donor states, the analysis was based on the historically observed trade shares using data produced by EUROSTAT. These shares are observed to be fairly robust over time. In the cases of the four “old” recipient states (Greece, Ireland, Portugal and Spain), the trade patterns are well established and change only very slowly.

In the case of the twelve “new” recipient states, the trade patterns evolved rapidly in the years immediately following the political and economic liberalisation processes that started in 1989. Very rapidly, the previous trade dominance of the former USSR and the rest of the COMECON bloc collapsed, and was replaced by a switch to trade with the member states of the EU. However, by the time of start-up of the cohesion expenditure programme 2000-2006 in the year 2004, the intra-EU patterns of trade were well established. We saw in Chapter 3 (Table 6) that the eleven donor states are now the dominant destinations for exports of the recipient states. The highest such dependence is by Spain, where 67.5 per cent of total Spanish exports are destined for the eleven donor states. The lowest dependence is by Latvia, where 39.1 per cent of exports go to the donor states.55

However, the investigation of Theme 4 requires very different data sources and a very different methodology. Here, we need to deal with individual projects, or small bundles of interrelated projects, where the individual contractors are explicitly identified. At first sight, this issue appears to involve a very simple and straightforward question. Namely, are the data on the award of public procurement contracts, funded at least in part under cohesion expenditure projects, gathered systematically and do they permit the identification of the appointed contractors? If not, what could be done to gather the data? But even if such data on appointed contractors were available, we also have to ask if they could then be used to derive a useful micro-based measure of the benefits to donor states.

6.2. A failed empirical investigation

When our response to the call for tenders was being prepared, we made initial enquiries to see if information on individual contractors would be likely to be made available to us, should we be awarded the contract. We started at the level of the Commission Services, where we made enquiries at DG Regional Policy (DG-REGIO). We were informed by DG-REGIO that, at the EC level, no centralised data or information about the contractors selected to carry out major public procurement contracts awarded under cohesion expenditure programmes were collected. The explanation for the lack of such data was that the individual contractors selected to carry out work on such projects as constructing roads, harbours, rail networks, telecommunication grids, etc., are not, in fact, regarded by the Commission as direct “beneficiaries” of the cohesion programmes. The actual beneficiaries are regarded as the national or regional administrations who apply for financial support under the various cohesion expenditure programmes. For the programming period 2000 to 2006, no regulation existed that required collecting information on contractors, i.e., the ultimate direct beneficiaries of projects funded by cohesion expenditure policies. Consequently, the Commission authorities could not supply such information.

55 The low share for Latvia is an anomaly, caused by the dominance of three non-donor state export destinations: Estonia, Lithuania and Russia, which together account for over 50 per cent of total Latvian exports.
We also learned that for the cohesion expenditure programme period from 2007 to 2013, the situation is an improvement on that of the previous programming period. All direct beneficiaries in the current programme have to be published by the national Managing Authorities by the middle of the following year, under the rules governing the implementation of the 2007-2013 funds (EC No 1828/2006). The published information must contain the name of the beneficiary, the names of the operations, and the amount of public funding allocated to the operations. However, information concerning the individual contractors selected via public procurement contracts, i.e. the names of those firms who carry out all or part of the actual work, still do not have to be collected.

We then approached the administrations in five countries: one donor state (Germany) and four recipient states (Portugal, Spain, Ireland and Poland). The initial response appeared promising, and we were given some indications that such data on selected contractors could be extracted, if required. On that basis, we made the assumption that appropriate data would be accessible to address the questions raised in Theme 4. We had already confirmed with the Commission authorities (DG-REGIO) that all the data required for the macro analysis (i.e., the cohesion expenditures at the project, measure, Operational Programme and total programme for the period 2000-2008) would be made available to us for analysis based on the HERMIN models.

Having been awarded the contract, we again approached the previously mentioned public administrations in the latter part of 2008 and specified the kind of data on individual contractors that we needed. Our first disappointment was that national managing authorities, who had previously given us some assurance concerning data availability, now referred us on to units in the various line ministries who were responsible for the actual management, monitoring and evaluation of specific Operational Programmes. We very quickly ran into difficulties, and it soon became clear that no registers of individual contractors were maintained in a way that would permit them to be linked to specific projects funded under the cohesion expenditure programmes. In some cases we were told that such data probably did exist at some level of the various government and local government units who were responsible for projects. But the timing of our enquiries was very unfortunate, coming as it did just when all the administrations were frantically trying to wrap up all remaining projects from the programming period 2000-2006. If such projects were not completed before December 31st, 2008, there would be a risk that some funds might be lost.

Reluctantly, we were forced to conclude that no systematic data collection had been carried out that would permit us to identify individual contractors selected to execute projects under the 2000-2006 cohesion expenditure programme. Consequently, we would be unable to identify the nationality of such contractors, in order to answer the question posed in Theme 4: namely, what percentage of major procurement projects have been awarded to enterprises from donor countries?

We considered whether it might be possible to gather the missing information on the basis of a survey of major contracting firms in the donor states who operated in the important areas of civil engineering and construction. These would be the kinds of firms who would bid for large-scale public procurement contracts in the area of physical infrastructure. However, the time and the resources allocated to the project made this approach impossible. In any case, we were doubtful if such a survey would have provided useful

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information, even if it had been feasible to carry it out. We explain this point in the concluding section.

6.3. Some conclusions and recommendations

We are forced to admit that we cannot answer the question posed in Theme 4. But even if data were available that permitted us to give an answer, we question how useful that answer might be. For example, imagine a situation where we were able to state that of all the major public procurement contracts issued in (say) Poland during the programming period 2000-2006 (i.e., between the years 2004 and 2008), X per cent were awarded to contractors whose registered offices were in one of the eleven donor states. Imagine further that we could split up the aggregate Polish figure of X per cent for all donor states into eleven separate percentages that made available the contractors whose registered offices were in each of the eleven donor states. What could we conclude from such data?

Knowledge that a specific percentage of major public procurement projects carried out during the Polish programming period 2000-2006 had been awarded to enterprises from a specific donor state, or from all donor states, would tell us almost nothing about the benefits that these individual firms had actually received from a specific project that was partly funded by cohesion expenditure. Every such project is likely to have special characteristics. For example, a German major contractor might win a specific project, and might act as overall project co-ordinator. But the execution of the work on the ground might consist of a series of subcontractors, not all of whom will necessarily be German. Design work might be carried out by another firm. Initial excavation works by yet another. And so on, into a complex of relations between the main contractor and all the subcontractors. At the end of the day, much of the funding might actually find its way back to Poland, to pay for Polish subcontractors operating under the general co-ordination of the German main contractor. Indeed, the German main contractor might even employ Polish labour directly to carry out some of his allotted tasks.

In order to overcome this problem caused by lack of information, it would be useful to make it mandatory for the Managing Authorities in all the recipient states to document the main contractor selected to carry out any major public procurement project with their country of origin, and to require that these main contractors identify and declare the share of the project budget that is devoted to sub-contractors, whose national identity should also be recorded. Only in this way would we be able to begin to gauge how the benefits of the associated cohesion expenditure was actually distributed across donor and recipient member states for major public procurement projects.

Although such an analysis would be useful in isolation, it would be even more useful if it were embedded in a wider micro-based analysis of major public procurement projects. Given the complexity of most large-scale public procurement infrastructure projects, and the obvious problems of business confidentiality that would limit the kind of data that would be reasonable to expect a main contractor to make available, a much better context for analysis of benefits to recipient and donor states at the micro level should be sought in the context of detailed cost-benefit analysis studies, augmented by details of the contractors who carried out the work.

We make this suggestion in the knowledge that very little by way of such detailed micro studies has ever been published by the Commission as spin-offs from the extensive ex-
ante, mid-term and ex-post evaluation exercises that have always been part of each programming period. This is a bad situation, and makes it more difficult to arrive at any robust evaluations of how the micro-level benefits of cohesion expenditure arise in, and are shared between recipient and donor states. Indeed, it also makes it more difficult to carry out robust macro studies of the kind reported in Chapters 3-5, since an understanding of the macro spillover mechanisms is based on micro analysis (see Bradley, et al, 2006).
7. SUMMARY AND CONCLUSIONS

The tasks to be addressed in this report were set out in the form of six “themes”, five of which focused on questions of macroeconomic impact and one of which adopted a firm-specific or microeconomic perspective. Within the set of five macroeconomic themes, there was a further subdivision into two separate categories. The first macro category addressed questions concerning the impact of cohesion expenditure programmes on the so-called recipient states, i.e., the fourteen member states designated in whole or in large part as Objective 1 for the purposes of the EU budgetary programming period 2000-2006. The second macro category addressed questions concerning the spillover benefits for the donor states of the impacts on the recipient states, where the eleven donor states were those making a net contribution to the EU budget during the period of implementation of the 2000-2006 programme. Finally, the single micro theme sought to quantify the number of firms from the donor states which benefited from the award of project contracts that were part funded by the cohesion expenditure programmes.

In this final chapter we bring together the main conclusions that we reached as we sought to answer the questions posed. We take the five macroeconomic themes first, in a sequential order in which the research required to provide answers was carried out. This order, rather than the numerical order from the original call for tenders, makes for a more logical presentation of the conclusions. We then turn to the single microeconomic theme, where we were unable to provide any answers. Having summarised our conclusions, we then present a series of recommendations arising from our research, that the Committee may wish to follow up in its continuing work of evaluating the cohesion expenditure programmes of the current period, 2007-2013.

7.1. Macroeconomic themes: recipient states

Theme 2: How do cohesion expenditure interventions influence the economic aggregates and the structure of the recipient economies? In particular, what part of the cohesion expenditure grants will be transformed into demand and production?

The quantitative analysis designed to answer this question was presented in Chapter 4, whereas Chapter 3 provided an overview of the modelling methodology used, and Chapter 2 summarised the data inputs from the cohesion expenditure programmes 2000-2006 and 2007-2013. It is important to recall our assertion that the question of impact of cohesion expenditure on the recipient states cannot be answered by simply observing the economic outcome or performance of these economies as reflected in the national accounting and other data published by the national statistical agencies and by EUROSTAT. Too many other factors are changing during the years of policy implementation, and it is impossible to assign the outcome to any specific factor, or to the cohesion expenditures simply by observing post programme performance.

The extraction of the specific impacts of the cohesion expenditures requires the use of macro models of the recipient economies, which can be used to control all influences other than cohesion expenditures, and then to run counterfactual simulations where only the cohesion expenditures are altered. By comparing a “with policy” simulation and a “without policy” simulation, we can quantify the specific impact of the cohesion expenditures on each recipient state.
As explained in Chapter 3, the cohesion expenditures impact on the recipient economy in two very different ways. First, during the implementation years, 2000-2008, when investment programmes are being carried out, the boost to (mainly) public expenditure serves to stimulate the demand side of the economy. Obviously the output of the building and construction sector will be boosted directly, as this is the sector of the economy that actually produces the infrastructure improvements. So, public investment will increase, and this will induce further private investment. As extra workers are hired, and spend their wages, this will boost private consumption more generally. To satisfy the increased demand for specific kinds of investment goods, many of which will not be produced locally, imports are stimulated. These demand-side processes will be active during the implementation years (2000-2008), but will effectively terminate after the programme ends on December 31st, 2008.

Meanwhile, as the investments supported by cohesion expenditure are implemented, the main impacts on the supply side of the recipient economy are to improve the magnitude and quality of the stock of national infrastructure, the quantity and quality of the stock of human capital, and the stock of accumulated R&D available to private firms (some carried out by public sector agencies and the rest by private firms). These stock improvements build up during the implementation period, driven by the increased flow of investment. They generate spillover benefits to the recipient economy in the form of direct boost to sectoral production in manufacturing and market services, and to increased productivity in these sectors. These supply-side spillovers continue long after the flow of increased cohesion expenditure terminates in 2008, although all three stocks will be subjected to the usual kinds of depreciation processes.

The best summary of how production in the recipient states will be affected by cohesion expenditure programmes is provided by the so-called “cumulative” multiplier. We recall that this is calculated for any specific year by accumulating all previous increases in GDP that were attributable to the cohesion expenditure, and dividing them by the magnitude of the accumulated cohesion expenditure (expressed as a share of GDP). During the programme implementation years, some of the boost to GDP is attributable to the cohesion expenditure injections. But after the programme terminates, in December 31st, 2008, there are continued supply-side benefits in terms of increased GDP, but no further injection of funds.

We display the cumulative multipliers in summary form for all fourteen recipient states in Figure 21 below.
In Chapter 4 we divided these results into three groups, based on a ranking by the size of the cumulative multipliers:

**High values (above 3.0):** IE (4.0), ES (3.3), CZ (3.3) and MT (3.1)

**Medium values (2.5 to 3.0):** SK (2.8), EL (2.8), EE (2.8), PT (2.6), PL (2.5)

**Low values (below 2.5):** LT (2.4), HU (2.4), SI (2.2), CY (2.2), LV (1.9)

Based on our assumptions of the size of the spillover mechanisms, this suggests that some recipient states are more effective in translating the cohesion expenditures into increased output than others. Those states with the highest multipliers are the most effective. As the multiplier declines, less of the cohesion expenditure ends up as increased production, and appears either as a demand-side stimulus during the implementation period that terminates after 2008, and as increased demand for imports. However, our analysis suggests that in all cases an injection of one per cent of GDP in the form of cohesion expenditure will generate a return of at least two per cent of GDP in the long run, mainly as a result of the supply-side spillovers into production and productivity.

A final point to make with respect to the quantification of cohesion expenditure impacts is that the appropriate magnitude of the crucial spillover parameters (i.e., the size of the beneficial spillovers associated with improved stocks of physical infrastructure, human capital and R&D) are not known with any degree of precision. Our selected values are representative of the average values found in an international literature that is seldom based on research carried out in the recipient states. The reason is not that we choose to ignore such research. Rather, there is no such research available yet in the new member states. Indeed, the HERMIN models are often among the first such models of some of the states.

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57 The slow build up of economic research in the new member states creates wider problems for economic policy analysis. Unfortunately, research carried out during the previous era of central planning is irrelevant. And reliable
new member states that are suitable for use in deep, structural policy analysis and medium-term projections. As a result, we have to examine the sensitivity of our results to variations in the sizes of the parameters. Such analysis shows the obvious: namely, the higher the spillovers, the larger the supply-side impacts on the recipient states.

**Theme 3:** How big a share of cohesion expenditure interventions will leak to more prosperous regions via increased demand for imports from these regions? How are imports from donor states likely to evolve compared with the situation without structural funding?

The answer to this question is obtained from a continuation of the analysis of Theme 2. In Theme 2 the impact of the cohesion expenditure on production was explored and quantified. But we know that the ability to absorb cohesion expenditure depends on the availability of specialised imports of capital and other goods that are needed to implement the investment projects that make up the programme. At the macro level, the HERMIN models do not distinguish between imports of capital goods, and imports of consumer and other intermediate goods. What we do quantify is the net impact of the balance of trade in the recipient state that can be directly attributed to the absorption of cohesion expenditure.

The impacts on the net trade balances were shown for all fourteen recipient states in the graphs contained in Figure 6 of Chapter 4. **In every case the trade balance deteriorates during the implementation phase (2000-2008), as the actual investments are being put in place and the capital and other goods and services are being imported in cases where they are not produced locally.** Of course, this increased demand for imports by the recipient states can be potentially satisfied by any exporting country in the world, and not just by increased exports from the eleven donor states. How much actually comes from exports of donor states is determined by the existing trade exposure of the recipient states to the donor states, and this is summarised in Figure 22, reproduced from Chapter 3.

**Figure 22: Percentage of total exports of donor states going to recipient states (2007)**

[Bar chart showing percentage of total exports of donor states going to recipient states (2007)]

Data from the post-liberalisation era only became available effectively from 1995 onwards. This is in contrast to the situation in the donor states, where many decades of detailed quantitative research findings are available as a guide to model builders and policy analysts.
Consequently, those donor states which have a high trade exposure to the beneficiary states (Germany, France and Italy, in particular) will be the likely beneficiaries of the increased demand for imports emanating from the recipient states. Of course, trade is a two-way process. As the recipient state economies begin to benefit from the supply-side improvements associated with cohesion expenditure, they, in turn, are likely to export more to the donor states. Indeed, we showed in Chapter 3 that the donor states made up a much higher share of the export markets for the recipient states than the recipient states did for the donor states. The relevant market shares are reproduced in Figure 23 below.

Figure 23: Percentage of total exports of recipient states going to donor states (2007)

Consequently, it is the net impact on recipient and donor state trade that matters. Our analysis showed that all the recipient states run trade deficits (relative to the no cohesion expenditure case) during programme implementation, and that this switches to a net trade surplus (once again, relative to the no cohesion expenditure case).\(^{58}\)

7.2. Macroeconomic themes: donor states

**Theme 1:** How much of economic growth in donor states can be attributed to cohesion expenditure interventions in recipient states?

This question posed in this theme is in terms of the spillover impact of cohesion expenditure programmes on growth in the donor states. We reiterate our earlier observation that any such spillover impacts will be transitory, at best. Our analysis of impacts on the recipient states, as reported in Chapter 4 and summarised above, shows

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\(^{58}\) It should be noted that almost all the recipient states have run trade deficits over the years of the 2000-2006 programme. In some cases, such as in the Baltic States, these deficits are very large as a percentage of their GDP. Our analysis only looks at the change in the deficit when the cohesion expenditure policies are switched off. If there was a high underlying trade deficit, this will remain into the medium term, since the cohesion expenditure shocks are modest in size.
that there is a medium-term impact on the level of activity of the recipient states (i.e., GDP, employment, productivity, etc.), but no long-term impact on the growth rate of the recipient states. Consequently, any spillovers from recipient states will also only produce medium-term level rather than growth impacts on the donor states.

However, it is correct to state that as GDP in a recipient state economy is boosted from a lower to a higher level, there will be transitory growth impact. But in the medium-term, i.e., after the programmes are terminated, the rate of growth in any recipient state for the "with-cohesion expenditure" case will be identical to the rate of growth in the "without-expenditure" case, assuming that nothing else has altered as between the two simulation scenarios. It should be recalled that the EU “cohesion” objective is formulated in terms of the level of GDP per head, and not in terms of growth rates. The attainment of the cohesion objective, of course, will require that the lagging recipient states will need to grow faster that the more prosperous donor states, at least for a transition period.

The HERMIN-based simulations reported in Chapter 5 show how, in the implementation years of the cohesion expenditure programmes, there are positive impacts of trade-boosting spillovers from recipient states to donor states. However, the simulations also show that these are more than off-set by the negative impact on the donor economies of having to finance the budget contribution by raising taxes. Recall that in our simulations we assumed that the EU budget contributions in the donor states were financed by raising the rate of personal income tax, and that the contributions were only made during the implementation years of the programme, i.e., 2000-2008.

The country by country graphs presented in Figure 14 of Chapter 5 demonstrate the impacts on GDP and employment in the donor states. It was seen that some donor states benefit more than others from the indirect spillovers. For example, France, the United Kingdom and Italy were seen to suffer no significant negative growth or employment impacts even during the implementation years 2000-2006, when it was assumed that budget contributions had to be made. In the case of these three donor states, the relatively small size of their net budget contribution, combined with the strong orientation to their trade with the recipient states (and to Spain and Ireland, in particular), resulted in positive spillovers during the implementation and post-implementation years.

The Netherlands and Luxembourg, on the other hand, were seen to experience the largest negative impacts on GDP and employment of all the donor states during the period 2000 to 2008, when they are assumed to be making net contributions to the EU budget. This can also be explained in terms of the relatively large size of their budget contributions, when expressed as a percentage of their GDP. The negative outcome is also exacerbated by the structure of these two economies (as captured by their HERMIN models), and their relatively weak trade orientation to the main recipient states in Eastern and Southern Europe. But it should be stressed that even in the case of the Netherlands, where the negative impact on GDP was largest, the level of GDP was only reduced at most by about 0.8 of one percentage point.

So the direct answer to the question posed in Theme 1 is that there is no long-term impact on the growth rates of the donor states due to the combination of their budget contributions (negative) and the spillover benefits from increased import demand by the recipient states (positive). But there is a small negative effect on the level of GDP in eight of the eleven donor states, France, Italy and the United Kingdom being exceptions. Consequently, there is a small transitory negative impact on the growth of GDP in the donor states. In all cases, the level
effect turns positive after the implementation phase terminates (i.e., after 2008), but this is so small as to be negligible compared to normal fluctuations in growth rates that are regularly experienced by EU economies.

This is illustrated in the case of Germany in Figure 24 below, which shows how the growth rate of GDP is affected by cohesion expenditures. In the first year of the programme, the growth rate is cut by 0.26 percentage points. The only other significant change to the growth rate comes in 2009, when it is increased by 0.14 percentage points. In both cases, the change is that of the “with-policy” growth rate minus the “without policy” growth rate.

**Figure 24: Impact of German GDP growth rate due to cohesion expenditure 2000-2006 programme**

**Theme 5:** How many jobs in donor member states depend upon cohesion expenditure financial transfers?

In our analysis of this question, we stressed in Chapter 5 that it has to be addressed very carefully. The distinction needs to be made between total employment numbers in the donor state economy, or in certain sectors of the economy, and specific employment in work that is associated with sectors which are involved in trade with the recipient states. Thus, even in the case of the Netherlands, where the overall impact on total employment was seen to be negative (see Figure 14, Panel (d)), there are still likely to be specific jobs that are dependent on the cohesion expenditure spillovers into the Netherlands. Nevertheless, the overall impact is negative. However, we showed that the absolute numbers of jobs “lost” in any donor state was very small.

Our answer to this question is as follows. First, it is impossible to identify those jobs in the donor states that are explicitly dependent on cohesion expenditure financial transfers. The difficulty of doing so will be taken up in our conclusions relating to the single microeconomic theme, to be treated below. However, we can say that in most of the donor states, the net impact on total employment is negative during the implementation years 2000-2008, and becomes positive thereafter. The exceptions are France, Italy and, to a degree, the United
Kingdom, where net employment gains are recorded even during the implementation years.

Of course, if we ignored the negative impacts on the donor state economies of financing their EU budget contribution, the GDP and employment impacts would be entirely positive, and associated with the trade spillovers from the recipient states. The comparison between the “pure” spillover employment impact and the “net” employment impacts are illustrated in Figure 25, once again using Germany as the case study.

**Figure 25: Impact of German numbers employed due to cohesion expenditure 2000-2006 programme**

A comparison of the “net” and the “pure” impacts shows the extent to which the financial costs of the budget contribution has a negative impact on the donor economy. Only in the exceptional cases of France, Italy and the United Kingdom is there a positive employment impact for both the net and the pure scenarios.

**Theme 6:** What is the effect of cohesion expenditure transfers upon cash flows?

Since this was a somewhat ambiguous question, we needed to adopt a specific interpretation. We selected three specific measures:

a) The net trade balance;

b) The public sector financial balances; and

c) Profits in the corporate sector.

The exact measures in the HERMIN models were as follows: the impact on the net trade balance, expressed as a percentage of GDP; the impact on the government’s borrowing requirement, also expressed as a percentage of GDP; and the impact on corporate sector profits, expressed as a percentage change from the no-policy baseline.

The results of the impacts of the 2000-2006 cohesion expenditure programme on these three measures were presented in a series of mini-graphs in Figure 6 in Chapter 5. The results all followed a similar pattern. Taking the case of Germany as a
typical example, the impact of cohesion expenditures (i.e., the net impact of financing the budget contribution and the trade spillovers from the recipient states) on the German net trade balance was uniformly positive, but it is only boosted by a maximum of 0.2 percent of GDP (in 2004). The impacts on the German public finances were also small, and showed that the government borrowing requirement, expressed as a percentage of GDP, increased slightly for the years 2000 to 2008, and fell slightly thereafter (both relative to the no-policy baseline). The biggest increase was recorded in the year 2003, but was only 0.1 percentage points. Finally, corporate profits fell slightly during 2000-2008, and improved thereafter. Given the small size of these effects, it is difficult to draw any firm and robust conclusions with respect to the question raised in theme 6, other than to state that the impacts on cash flows in all donor states are very minor, and probably well within any margin of error surrounding the structure and operation of the HERMIN models.

7.3. Microeconomic theme

Theme 4: What is the percentage of contractors from donor member states that have been awarded major public procurement contracts funded partly by cohesion expenditure?

In Chapter 6 we have outlined how we searched for sources of data that would permit us to address the question of how individual firms benefited from cohesion expenditures. Unfortunately, we failed, both at the level of the Commission itself, and at the level of national and regional administrations.

Reluctantly, we were forced to conclude that no systematic data collection had been carried out that would permit us to identify individual contractors selected to execute projects under the 2000-2006 cohesion expenditure programme. Consequently, we were unable to identify the nationality of such contractors, in order to answer the question posed in Theme 4: namely, what percentage of major procurement projects have been awarded to enterprises from donor countries?

We examined whether it might be possible to gather the missing information on the basis of a survey of major contracting firms in the donor states who operated in the important areas of civil engineering and construction. These would be the kinds of firms who would bid for large-scale public procurement contracts in the area of physical infrastructure. However, the time and the resources allocated to the project made this approach impossible. In any case, we were doubtful if such a survey would have provided useful information, even if it had been feasible to carry it out.

In the concluding section of our report, we make some recommendations on how this problem of data might be addressed, and what kind of data would be most appropriate and useful to gather.

7.4. Policy recommendations

The examination of spillovers from the beneficiary states to the donor states is an area of policy analysis that has been generally neglected since EU cohesion policies were reformed and expanded in the late 1980s. Previous attention has usually focused on the impacts on
the recipient state economies, neglecting global spillovers. To our knowledge, the present study is the first of its kind.

Our recommendations relate to various stages of the analysis, starting with the lack of analysis of the impacts of cohesion expenditure at the project or microeconomic level. The absence of any systematic approach to this kind of work on the part of the Commission services means that most previous impact evaluation studies that try to gain a broad overview of the role of cohesion expenditures have been carried out at the macroeconomic level. But macro evaluations depend crucially on access to information concerning the detail of how the cohesion policy programmes are planned and implemented, and on knowledge of the quality of a range of representative projects from each of the three broad economic categories of investment: physical infrastructure, human resources and direct aid to private firms.

In the absence of systematic knowledge and quantification at the micro level, evaluators at the macro level have little or no idea of how to select the macro spillover parameters whose role is to act as “integrators” of micro information on the quality of programme design and project selection. The danger is that poorly designed programmes, and inadequate project selection criteria will result in programme macro impacts that are largely confined to the implementation period, and have low (or no) longer term supply-side benefits. Since much of the required micro analysis needs to be carried out on the ground, by people close to the design and implementation of the programmes in the recipient states, we strongly recommend that such analysis be made a formal part of the programme application and implementation procedures, carried out along formalised guidelines set down by the Commission, and results compared across all recipient states. Too often in the past, only lip service has been given to such work, and it has tended to become lost in a vague and non-rigorous process of project monitoring, where the ability to spend the funds within the specified time period becomes the unique priority, and other criteria are often ignored.

A closely related recommendation concerns the requirement to be able to identify the individual contractors that are selected to carry out major public procurement projects, mainly in the areas of physical infrastructure and major training schemes. Our failure to answer the question set out in Theme 4 was due to the complete lack of any such data in the public domain. In order to overcome this problem caused by lack of information, we recommend that the Managing Authorities in all the recipient states be required to document the main contractor selected to carry out any major public procurement project with their country of origin, and to require that these main contractors identify and make available information on the share of the project budget that is devoted to sub-contractors, whose national identity should also be recorded. Only in this way would we be able to begin to gauge how the benefits of the associated cohesion expenditure was actually distributed across donor and recipient member states for major public procurement projects.

Taken together, the above two recommendations would greatly expand the knowledge base available to the Committee as it exercises oversight on cohesion expenditure programmes. Although the recommendations would be useful in isolation, it would be even more useful if both were embedded in a wider micro-based analysis of major public procurement projects. Given the complexity of most large-scale public procurement infrastructure projects, and the obvious problems of business confidentiality that would limit the kind of data that would be reasonable to expect a main contractor to make available, the benefits to recipient and donor states at the micro level should be explored in the context of detailed cost-benefit analysis studies, augmented by details of the contractors who carried out the work.
Our next recommendation relates to the manner in which the different cohesion expenditure programmes have been analysed in isolation from each other in the past. In our report, we were requested to carry out, essentially, an ex-post impact analysis of programme 2000-2006, whose implementation period covered the years 2000-2008. This is a very unsatisfactory and unscientific approach, driven by administrative requirements to account formally for allocated budgets in each separate programming period. In fact, the various rounds of public investment supported by cohesion expenditure are not isolated from each other in practice. For the four “old” recipient states, the programmes for 1989-1993, 1994-1999, 2000-2006 and 2007-2013 represented an unfolding sequence of closely inter-related investment projects, many of which spanned multiple programming periods. To analyse the programming period 2000-2006 in isolation runs the risk of artificially truncating investment projects, and disrupting the manner in which supply-side benefits manifest themselves as major projects are gradually brought to completion. In the case of the “new” member states, the current programming period simply extends and deepens work started in the previous period, when these states were first given access to cohesion support.

We recommend that in future impact studies, close attention be given to the continuity between past and future cohesion expenditure programmes. An example of why this is important was demonstrated in the case where we examined the back-to-back consequences of the programming periods 2000-2006 and 2007-2013 in terms of spillover benefits for Germany. Taken in isolation, there were found to be negative impacts of programme 2000-2006 on Germany during the implementation years 2000-2008, and the impacts only turned positive in the post-implementation period. If we had analysed the impacts of the programme period 2007-2013 in isolation, a similar result would have been found. However, when we ran both programmes back-to-back, the impacts remained positive for Germany, even during the implementation phase of programme 2007-2013 (i.e., the years 2009-2015), when budget contributions were being made.

Finally, we make a wider recommendation based on the fact that the spillover impacts of cohesion expenditure on donor states are so small that there is a risk that such programmes might be regarded as unimportant for donor states. It would be more logical to study the impacts of cohesion expenditure within the wider context of the progressive deepening of the Single European Market and the prospects of the adoption of the euro by the new member states, probably during the current programming period. When one asks the question: “what are the impacts of the cohesion expenditures, in isolation from any other changes?”, the impacts turn out to be relatively small. But, of course, the funding is relatively small compared, say, to the size of national public sector budgets.

An explicit joint treatment of the impacts of the Single Market and cohesion expenditure was carried out for the four “old” cohesion states as part of the review process directed by Commissioner Mario Monti (refer, Barry et al, 1997). This study showed that the combination of the Single Market reforms plus the cohesion expenditure programmes of 1989-1993 and 1994-1999 gave rise to powerful synergistic interactions that generated high returns in terms of convergence, depending on the structure of the economies as captured in the HERMIN models. Consequently, the isolated study of cohesion expenditure programmes risks missing the wider benefits that stem from boosting the competitive performance of the recipient states. In particular, it may lead to neglect of the opportunities that open up for closer, mutually beneficial links between recipient and donor
states in the form of internationally mobile investment, specialist sub-supply, migration of workers with specific expertise and experience, in addition to the more direct impacts in terms of increased import demand that we have examined in this report.
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ANNEX 1:
THE MODELLING FRAMEWORK:
RECIPIENT AND DONOR STATES

A1.1 Introductory remarks

The Keynesian, demand-driven view of the world that dominated macro modelling prior to the mid-1970s was exposed as being entirely inadequate when the economies of the OECD were hit by the supply-side shocks of the crises of the 1970s. From the mid-1970s onwards, attention came to be focused on issues of productivity and cost competitiveness as important ingredients in output determination, at least in highly open economies. More generally, analysis of the importance of the manner in which expectation formation was handled by modellers could no longer be ignored, and the reformulation of empirical macro models took place against the background of a radical renewal of macroeconomic theory in general.

The original HERMIN modelling framework drew on many aspects of the above revision and renewal of macro economic modelling. The origins of the HERMIN model can be found in the complex multi-sectoral HERMES model that was developed by the European Commission in the early 1980s (d’Alcantara and Italianer, 1982). HERMIN was initially designed to be a small-scale version of the HERMES model framework in order to take account of the very limited data availability in the poorer, less-developed EU member states and regions on the Western and Southern periphery (i.e., Ireland, Northern Ireland, Portugal, Spain, the Italian Mezzogiorno, and Greece). A consequence of the lack of detailed macro-sectoral data, and of sufficiently long time-series that had no structural breaks, was that the HERMIN modelling framework needed to be based on a fairly simple theoretical framework that permitted analysis of a reasonably robust kind. Also, inter-country and inter-region comparisons were highly desirable, since they facilitated the selection of key behavioural parameters in situations where sophisticated econometric analysis was difficult, if not impossible.

An example of a simple but useful theoretical modelling framework is one that treats goods as being essentially internationally tradable (T) and non-tradable (N) (see Lindbeck, 1979). Drawing on this literature, relatively simple versions of the model can be used to structure debates that take place over macroeconomic issues in small open economies (SOEs) and regions. The HERMIN model shows how an empirical model can be constructed that incorporates (and builds on) many of these relatively robust theoretical insights.

A1.2 The structure of a HERMIN model

Since the HERMIN model is designed initially in order to analyse medium and long-term impacts of cohesion policies, there are three general and systemic requirements which it should satisfy:

i. The model must be disaggregated into a small number of crucial sectors which allows one at least to identify and treat the key sectoral shifts in the economy over the years of development.
The model must specify the mechanisms through which a “cohesion-type” economy is connected to the external world. The external (or world) economy is a very important direct and indirect factor influencing the economic growth and convergence of the lagging EU economies, through trade of goods and services, inflation transmission, population emigration and inward foreign direct investment.

The construction of the model must recognise that a possible conflict may exist between actual situation in the country, as captured in a HERMIN model calibrated with the use of historical data, and the desired situation towards which the cohesion or transition economy is evolving (or desires to evolve) in an economic environment dominated by EMU, the Single European Market and wider forces of globalisation. In other words, design and calibration purely on the basis of econometrics using past data (even where feasible) are likely to be inappropriate.

The framework design of the HERMIN model focuses on key structural features of a cohesion-type economy, of which the following are important:

a) The degree of economic openness, exposure to world trade, and response to external and internal shocks;
b) The relative sizes and features of the traded and non-traded sectors and their development, production technology and structural change;
c) The mechanisms of wage and price determination;
d) The functioning and flexibility of labour markets with the possible role of international and inter-regional labour migration;
e) The role of the public sector and the possible consequences of public debt accumulation, as well as the interactions between the public and private sector trade-offs in public policies.
f) Monetary mechanisms that may affect development in medium and long-term time horizons.

In order to satisfy these requirements, the HERMIN framework has five production sectors: manufacturing (a mainly (internationally) traded sector), market services (a mainly non-traded sector); build building and construction; agriculture; and government (or non-market) services: see Bradley et al., 1995 for an early description, and Bradley and Untiedt, 2008b for the latest updated versions.

The internal structure of the HERMIN modelling framework can be best thought as being composed of three main blocks: a supply block, an absorption block and an income distribution block. Obviously, the model functions as an integrated system of equations, with interrelationships between all their sub-components. However, for expositional purposes we describe the HERMIN modelling framework in terms of the above three sub-components, which are schematically illustrated in Figure 26.

Conventional Keynesian mechanisms are incorporated into the short-term behaviour of a HERMIN model. When subject to a demand shock, expenditure and income distribution sub-components generate fairly standard income-expenditure mechanisms. For example, the implementational phase of cohesion expenditure programmes has a demand component, as public expenditure is increased, but longer-term supply side benefits have not yet appeared.

But the HERMIN model has many neoclassical features in the longer term. Thus, output in manufacturing is not simply driven by demand. It is also influenced by price and cost competitiveness, where firms seek out minimum cost locations for production. In addition, factor demands in manufacturing and market services are derived on the assumption of
cost minimization, using a CES production function constraint, where the capital/labour ratio is sensitive to relative factor prices. The incorporation of a structural Phillips curve mechanism in the wage bargaining mechanism introduces further relative price effects. Most importantly, we will show in a later chapter that the cohesion policy mechanisms operate through the supply side of the model, at least in the medium to long term.

The model handles the three complementary ways of measuring GDP in the national accounts, on the basis of output, expenditure and income. On the output basis, HERMIN disaggregates five sectors: manufacturing (OT), building and construction (OB), market services (OM), agriculture (OA) and the public (or non-market) sector (OG). On the expenditure side, HERMIN disaggregates GDP into the conventional five components: private consumption (CONS), public consumption (G), investment (I), stock changes (DS), and the net trade balance (NTS). National income is determined on the output side, and disaggregated into private and public sector elements of wages and profits.

Since all three elements of GDP are modelled – output, expenditure and income - the output-expenditure identity is used to determine the net trade balance residually. The output-income identity is used to determine corporate profits residually. The modelling of all three sides of the determination of GDP – output, expenditure and income – is quite unusual in econometric models, but is required in order to analyse cohesion policies. Finally, the equations in the model can be classified as behavioural or identity. In the case of the former, economic theory and calibration to the data are used to define the relationships. In the case of identities, these follow from the logic of the national accounts, but have important consequences for the behaviour of the model as well.

59 The traded/non-traded disaggregation implies that only a net trade surplus is logically consistent. Separate equations for exports and imports could be appended to the model, but would function merely as conveniently calculated “memo” items that were not an essential part of the model’s behavioural logic.
Figure 26: The HERMIN Model Schema

Supply aspects

**Manufacturing Sector (mainly tradable goods)**
- Output = \( f_1(\text{World Demand, Domestic Demand, Competitiveness, } t) \)
- Employment = \( f_2(\text{Output, Relative Factor Price Ratio, } t) \)
- Investment = \( f_3(\text{Output, Relative Factor Price Ratio, } t) \)
- Capital Stock = Investment + (1-\(\delta\))Capital Stock\(_{t-1}\)
- Output Price = \( f_4(\text{World Price} \times \text{Exchange Rate, Unit Labour Costs}) \)
- Wage Rate = \( f_5(\text{Output Price, Tax Wedge, Unemployment, Productivity}) \)
- Competitiveness = National/World Output Prices

**Building and Construction Sector (mainly non-tradable)**
- Output = \( f_6(\text{Total Investment in Construction}) \)
- Employment = \( f_7(\text{Output, Relative Factor Price Ratio, } t) \)
- Investment = \( f_8(\text{Output, Relative Factor Price Ratio, } t) \)
- Capital Stock = Investment + (1-\(\delta\))Capital Stock\(_{t-1}\)
- Output Price = Mark-Up On Unit Labour Costs
- Wage Inflation = Manufacturing Sector Wage Inflation

**Market Service Sector (mainly non-tradable)**
- Output = \( f_6(\text{Domestic Demand, World Demand}) \)
- Employment = \( f_7(\text{Output, Relative Factor Price Ratio, } t) \)
- Investment = \( f_8(\text{Output, Relative Factor Price Ratio, } t) \)
- Capital Stock = Investment + (1-\(\delta\))Capital Stock\(_{t-1}\)
- Output Price = Mark-Up On Unit Labour Costs
- Wage Inflation = Manufacturing Sector Wage Inflation

**Agriculture and Non-Market Services: mainly exogenous and/or instrumental**

**Demographics and Labour Supply**
- Population Growth = \( f_9(\text{Natural Growth, Migration}) \)
- Labour Force = \( f_{10}(\text{Population, Labour Force Participation Rate}) \)
- Unemployment = Labour Force - Total Employment
- Migration = \( f_{11}(\text{Relative expected wage}) \)

**Demand (absorption) aspects**
- Consumption = \( f_{12}(\text{Personal Disposable Income}) \)
- Domestic Demand = Private and Public Consumption + Investment + Stock changes
- Net Trade Surplus = Total Output - Domestic Demand

**Income distribution aspects**
- Expenditure prices = \( f_{13}(\text{Output prices, Import prices, Indirect tax rates}) \)
- Income = Total Output
- Personal Disposable Income = Income + Transfers - Direct Taxes
- Current Account = Net Trade Surplus + Net Factor Income From Abroad
- Public Sector Borrowing = Public Expenditure - Tax Rate * Tax Base
- Public Sector Debt = (1 + Interest Rate \(\times\) Debt\(_{t-1}\) + Public Sector Borrowing

**KEY EXOGENOUS VARIABLES**

*External:* World output and prices; exchange rates; interest rates;
*Domestic:* Public expenditure; tax rates.
A1.3 The country coverage of the HERMIN system

The first HERMIN national model was constructed to analyse the impacts of the Irish Community Support Framework 1989-1993 (Bradley, Fitz Gerald and Kearney, 1992). Shortly afterwards it was extended to Greece, Portugal and Spain (Bradley et al, 1995). As the former COMECON states of central and Eastern Europe moved towards EU membership, the HERMIN coverage was further extended, and now embraces all the new EU member states that are in receipt of cohesion expenditure assistance, including Bulgaria and Romania.

The extension of the HERMIN system to the donor states was carried out as part of the present project. Basically, the same modelling structure is used, in terms of the coverage of five production sectors and the coverage of the expenditure and income sides of the national accounts.

The main difference between a HERMIN model of a “recipient” state and a “donor” state is that all the cohesion expenditure instruments and mechanisms have been removed from the donor state models.

Full information of the “recipient” state HERMIN models in available in Bradley and Untiedt, 2008b. Information of the “donor” state HERMIN models in available in Bradley and Untiedt, 2009.
ANNEX 2:
RECIPIENT STATE IMPACTS:
PROGRAMMES 2000-2006 PLUS 2007-2013

A2.1 The annual size of the injections

Table 15 shows the cohesion expenditure injections into the recipient states for the combined programmes 2000-2006 followed immediately by 2007-2013. In other words, we run these two programmes together as if they were one continuous programme that started in 2000 (at least for the “old” recipient states), and ended in 2015, invoking the “n+2” rule. Greece, Ireland, Portugal and Spain, which received significant contributions, relative to the size of their GDPs, continue to receive smaller contributions, and Ireland effectively drops out of the “recipient” group. However, the contributions of the “new” recipient states continue to be large, and by the second programme period, most of the funding is directed at these states.
Table 15: Cohesion expenditure programme 2000-2006 and 2007-2013: annual injections
EU element (GECSFRAE) and including national co-financing (GECSFRAP), expressed as a per cent of GDP

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*Ratio of total public structural fund expenditure relative to GDPEV (per cent, GECSRAP)*
Once again, it is important to stress that the size of the funding injection, expressed as a percentage of ex-post GDP, will be influenced by the pattern of growth of GDP in the baseline (or “with-funding”) simulation, partially as a result of the policy impacts themselves. This may distort inter-country comparisons. The task of preparing detailed and authoritative long-term economic forecasts for all of the recipient states would be a major project by itself. Even the Commission’s forecasts for the new member states are sketchy beyond 2009.

**A2.2 Cumulative size of the injections as a share of GDP**

Turning to Table 16, we show the different patterns of the cumulative injections of total funds (EC and domestic public contribution), for the combined 2000-2006 and 2007-2013 programmes, where these are also expressed as a percentage of GDP. These range from 4.7 percentage for Cyprus, over 6.6 percentage for Ireland to high values in the region of 43 percentage of GDP in the case Latvia, showing huge differences in the cumulative size of the injections across the combined cohesion expenditure periods.
Table 16: Cohesion expenditure programmes 2000-2006 and 2007-2013: cumulative injections
EU element plus national public co-financing, expressed as a per cent of GDP

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A2.3 The pattern of annual impacts on the level of GDP

Table 17 shows the impact on GDP of the total funds (EC plus domestic co-finance), expressed in terms of the percentage change in the level of GDP relative to the no-funds baseline value of the level of GDP. Once again, we must stress that it is vital that the results presented in Table 17 not be misinterpreted as impacts on the growth rate of GDP. Rather they are impacts on the level of GDP.

As with the earlier results of programme 2000-2007, analysed in Chapter 4, a common pattern can be seen in the results presented in Table 17. The impacts on GDP during the implementation years (which are 2000-2015 for the “old” recipient states and 2004-2015 for the “new” recipient states) are considerably higher than the post-implementation impacts. Once again, when interpreting Table 17 it should be stressed that a large impact on GDP does not necessarily imply efficient and/or effective use of funds, since it mainly arises directly from the injection of funds working through the Keynesian multipliers in an economy that is still operating well below full capacity. Cross-country comparisons must use the “cumulated” multiplier.
Table 17: Annual percentage increase in the level of GDP:
Cohesion expenditure for programmes 2000-2006 and 2007-2013 (EU element plus national public co-financing)

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152
A2.4 The pattern of cumulative impacts on the level of GDP

Table 18 shows the impacts of the total funds on the accumulated percentage rise in the level of GDP, for the combined 2000-2006 and 2007-2013 programmes. The table shows that in the medium term, the cumulative increase in the level of GDP associated with funds ranges from about 9.2 per cent, in the case of Cyprus; 54.7 per cent in the case of Poland; to about 78 per cent in the cases of Estonia, Latvia and 68 per cent for Lithuania.
Table 18: Cumulative percentage increase in the level of GDP
Cohesion expenditure for programmes 2000-2006 and 2007-2013 (EU element plus national public co-financing)

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A2.5 The emerging pattern of cumulative multipliers

As discussed in Chapter 4, a useful way of presenting the impact results in a manner that permits cross-country comparisons is to calculate the so-called “cumulative” multiplier, defined as the cumulative percentage increase in the level of GDP divided by the cumulative funding injection, expressed as a percentage of GDP. The results for the combined programmes 2000-2006 and 2007-2013 are presented in Table 19.
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Since the absolute level of GDP impacts shown in Tables 17 and 18 are replaced by the “cumulative” multiplier, one can now make inter-country comparisons, since the size of the “cumulative” multiplier is no longer dependent on the size of the funding injection. Using Table 16, one can divide the range of countries into three groups, based on a ranking by the size of the cumulative multipliers calculated for the combined operation of cohesion expenditure programme 2000-2006 and 2007-2013:

*High values (above 3.0):* IE (3.8), ES (3.2)

*Medium values (between 2.5 and 3.0):* CZ (2.9), MT (2.8), SK (2.7), EL (2.5)

*Low values (below 2.5):* EE (2.3), PT (2.3), PL (2.3), LT (2.4), HU (2.1), SI (2.1), CY (2.0), LV (1.8)

Once again, we stress that this ranking of effectiveness of cohesion expenditure programmes should not be over-interpreted, since model properties, particularly for the new, former COMECON states, are not very robust, since their structures are still in a state of flux. In addition, it should be recalled that we have assumed a fixed, common pattern of spillover parameters across all recipient states, “new” and “old”. This means that we are assuming that the quality of programme planning is the same in Ireland (on the one hand) as it is for Latvia (on the other). Clearly this may not always be a reasonable assumption, and we refer to the previous discussion of the point in Chapter 4.
READER'S NOTES
Role

The Policy Departments are research units that provide specialised advice to committees, inter-parliamentary delegations and other parliamentary bodies.

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- Regional Development
- Transport and Tourism

Documents