Does EU cohesion policy produce cohesion?  
The debate on Structural Funds

by

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Abstract:

After 15 years of sustained EU cohesion policy, implemented through National Development Plans (NDPs) and their accompanying Structural Funds (SFs), economists appear to remain divided on how to interpret the policy effectiveness of the outcome. Today, as new member states prepare for the next seven-year programme of EU cohesion aid, it is important to review this debate. We separate two main strands in the debate on the effectiveness of EU cohesion policy: an ideological strand and an empirical strand. In practice these tend to be interconnected.

Within the ideological strand of the debate, two contrasting positions on the EU’s role in promoting cohesion can be distinguished: the "Anglo-Saxon" approach and the "European" approach. The "Anglo-Saxon" approach focuses on stabilization, liberalization, and privatization as the crucial driving forces of cohesion, and tends to downplay the role of active cohesion policy interventions. The "European" approach is related to Gerard Roland’s concept of the “evolutionary-institutionalist perspective”, and places more emphasis on direct policy intervention and the provision of a range of public goods such as infrastructure and human capital, and tends to be supportive of active cohesion policy. Within the empirical strand, two contrasting positions can also be distinguished: what one might call the “testing” approach and the “impact quantification” approach.

Against this background, we examine the views of the various participants in the debate on EU regional policy, and the methodologies and tools of economic analysis that are commonly used to support different conclusions. Having surveyed the methodologies that have been used in hypothesis testing and policy impact analysis studies, we conclude that none of them are likely to provide a decisive resolution to the debate.

We suggest that EU National Development Planning, the framework for cohesion policy, is likely to be compatible with an updated version of the "Anglo-Saxon" model, and that many criticisms of EU cohesion policies are weakened by recent advances in spatial and growth research, as well as by insights derived from business strategy frameworks. Provided that the public investment policies are designed effectively, implemented efficiently and monitored carefully, the policy activism involved in National Development Planning does not involve any rejection of the "Anglo-Saxon" model. Rather, it may be a precondition for the successful and speedy operation of that model in economies that are at a low level of development.
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Introduction

In this paper I examine how policy designers and analysts faced into the challenges of the reformed and expanded EU cohesion policy and structural funds (SFs) in the late 1980s, and how European Commission and domestic policy makers addressed major design and impact evaluation problems. What was special about cohesion policy was its declared goal: to transform and modernise the underlying structure of the beneficiary economies in order to prepare them for greater exposure to international competition within the Single Market and the euro zone. Politically they were something of a “consolation prize” for the poorer EU member states to ensure that they supported the crucial Single Market reforms. SF policies moved far beyond demand-side stimulation, being aimed at the promotion of structural change, accelerated medium-term growth and real cohesion through mainly supply-side mechanisms. But unlike the well-funded and comprehensive preparations made by the Commission for the Single Market and EMU (Cecchini, 1988; Emerson et al, 1988; CEC, 1990), only modestly funded ex ante efforts were made to lay down intellectual research foundations for cohesion policy and structural funds (Monnier and Toulemonde, 1993).

Two aspects of cohesion policies should be distinguished. First, the design of an appropriate policy framework (or National Development Plan, henceforth, NDP), within which the role of increased public investment in a range of public goods could be planned rationally and optimally, and part financed by EU funding. Second, the ex-ante evaluation of the likely impacts of these policies, as well as a rolling evaluation of impacts as the policies are progressively implemented. Although these two stages should be closely connected, in practice most of the debate on cohesion policy has focused on the second – impact evaluation – stage. The first – design – stage tends to operate pragmatically against a background of the prevailing political-economic ideology and institutional arrangements. Governments and policy-makers have their own “shopping lists” and preferences, and NDP design tends to be an eclectic process of reconciling local political wishes with local and EU economic development priorities, against a background of EC oversight and arms-length evaluation.

Turning to the second – evaluation - aspect, the size of SF investment programmes was never a problem for policy impact analysis. Micro analysis, based on standard cost-benefit and other techniques, has been a long established and well-developed area of research (see

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1 There are many EU policies that are implemented through Structural Fund aid. For simplicity, we restrict ourselves to Structural and Cohesion Funds in the main Objective 1 countries and macro regions, where the bulk of EU regional aid is directed. These include countries, or regions of countries, whose general level of economic development is regarded as lagging behind the average for the Union as a whole. The conventional measure of Objective 1 status is a level of GDP per head less that 75 per cent of the average. EU cohesion policy is implemented through multiannual national or regional development plans (or NDPs) that are made up of Structural Funds and Cohesion Funds. For convenience, in the remainder of the paper we use the term Structural Funds somewhat inaccurately to embrace both.

2 Typically, SF expenditures have ranged from about 1 percent of GDP annually in the case of Spain, to over 3 per cent in the case of Greece and will reach up to 4 per cent of GDP in the case of the new EU member states of Central and Eastern Europe. In addition to micro evaluations of individual projects, the macro consequences are clearly important.
Mulreany (ed.), 2002 for a recent survey in the context of Irish SFs). Evaluating the macroeconomic impact of public expenditure had also been an active area of research since quantitative macro models were first developed in the 1930s (Tinbergen, 1939).3

One can approach policy evaluation from the macro (or top-down) perspective, or from the micro (or bottom-up) perspective. These are radically different methodologies, and their contrasting characteristics are summarised in Table 1.

### Table 1: Micro versus macro policy evaluation

<table>
<thead>
<tr>
<th></th>
<th>Micro (bottom-up)</th>
<th>Macro (top-down)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of disaggregation</strong></td>
<td>High (individual projects)</td>
<td>Low (aggregated, whole economy)</td>
</tr>
<tr>
<td><strong>Use of theory</strong></td>
<td>Weak (judgemental, CBA)</td>
<td>Strong (macroeconomics)</td>
</tr>
<tr>
<td><strong>Model calibration</strong></td>
<td>Judgemental/informal</td>
<td>Scientific/econometrics</td>
</tr>
<tr>
<td><strong>Policy impacts</strong></td>
<td>Informal/implicit/ranking</td>
<td>Formal/explicit/quantified</td>
</tr>
<tr>
<td><strong>Treatment of externalities</strong></td>
<td>Limited or ignored</td>
<td>Included and explicitly modelled</td>
</tr>
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Although standard techniques of micro analysis are available, it is still the case that published, accessible analytical micro studies of SF impacts are relatively rare and often take on the characteristics of descriptive monitoring rather than analytical evaluation. Only recently have efforts been made to systematise approaches to the micro evaluation of large-scale SF programmes in an integrated way (Honohan, (ed.), 1997; Bradley, et al., 2005), and this is still an area of active research. In what follows, I will focus on macro impact analysis, which can only be undertaken with the assistance of formal, analytical models of the cohesion processes taking place in the recipient national and regional economies. Hence, macro (or top-down) SF evaluation is as much about developing and using appropriate behavioural models as it is about deriving and interpreting quantitative impacts. Most of the debate presently revolves around the search for “appropriate” models.

Since almost half of the EU budget is now devoted to Structural Fund-type aid, it is essential to be able to evaluate its effectiveness.4 There have been two main elements in this process. The first is a wider political-economic literature that stands back from the narrow technical assumptions usually needed to implement and use empirical models, and explores more fundamental questions on the effectiveness of the Commission’s intervention into national policy making by means of National Development Planning. The second concerns the efforts that have been made to evaluate empirically the likely impacts of SF policies using a variety of different analytical policy models.

If economics were a truly scientific discipline (like physics or chemistry)-, there would be a dominant paradigm and the only policy models that would ever be used would be those that were not inconsistent with that paradigm. Within that class of models one could debate the range of narrow technical and practical assumptions usually needed to implement models empirically, and their impact on the results. However, as Larry Summers showed in his infamous paper on “The Scientific Illusion in Empirical Macroeconomics”, it has never proved possible to resolve disputes on policy paradigms in this scientific way (Summers,

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3 Tinbergen’s early contribution to the literature on the design and evaluation of supply-side policies still reads remarkably well after more than 40 years (Tinbergen, 1958).

4 Note that the EU budget represents only slightly more than 1 per cent of EU GDP, and is considerably smaller than the share of national budgets in national GDP.
1993). Instead, we have a less satisfactory debate, within which the different strands – ideological and technical – have tended to become inter-related. Researchers tend to come to debates in economics with different experiences and strong personal priors, and these often colour empirical analysis.

The rest of our paper is organised as follows. In Section 2 we explore some of the crucial ideological assumptions that underpin the design and evaluation of NDP-type public investment programmes. These tend to influence the attitude adopted to public policy interventions in a subtle and often unquantifiable way. In Section 3 we examine the empirical methodological tools that have been used in NDP impact evaluations, and suggest that the imprecision of the results may simply reflect the inability of such tools to render robust conclusions. In Section 4 we take one of the range of macro models used in NDP evaluation – the so-called HERMIN model – and illustrate how difficult it is, even within the framework of one empirical model, to provide answers to the often vague cohesion-type questions that tend to be posed by the EC and national policy makers. In Section 5 we suggest a more rational way forward in the area of NDP impact design and assessment.
The subtle influence of ideology

The term “cohesion” first came into widespread use in the European Union in the late 1980s, at a time when major reforms and expansions of EU regional aid were being carried out. As set out in Article 130a of the Treaty on European Union, there is an explicit aim to promote “harmonious development” with a specific geographical dimension: “reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions”. Thus, there is an explicit recognition that wide disparities are intolerable in any community, if that term is to have any real meaning.\(^5\)

Within the European Union, debate on economic policy (including cohesion policy) tends to have the Anglo-Saxon model in the blue corner, and what one might call the European model in the red corner. In a crude formulation, the Anglo-Saxon model shares many of the characteristics of the so-called “Washington consensus” (henceforth WC): namely, stabilization, liberalization, and privatization. Although used mainly in terms of transition and developing economies, these three broad WC policy recommendations are also very relevant to developed economies who wish to stay developed (relatively).

It is more difficult to pin down the European model. The European way of doing economic policy can be subtle and nuanced, as befits a Union made up of imperfectly integrated, culturally heterogeneous nation states. Certainly it is not the converse of the Washington Consensus: destabilization, autocracy and nationalisation! In trying to pin down the European model, I am attracted to Gerard Roland’s concept of the “evolutionary-institutionalist perspective” (EIP), developed within his study of the economics of transition, but a concept which also shares many characteristics of the elusive European model (Roland, 2000). Let me quote two issues where the WC and the EIP differ dramatically (Roland, 2000, p.331).

The first issue concerns attitudes to markets and liberalization. The proponents of the WC assert that markets will develop spontaneously provided government does not intervene. Supply and demand will be the focus of analysis. However, the proponents of the EIP insist on the importance of the institutional underpinnings needed to enhance market growth: a minimum legal and contracting environment, law enforcement, political stability, building of business networks and long-term partnerships. In the EIP the contracting agents and their institutional environment, will be the focus of analysis.

The second issue concerns the main emphasis of government action and reform. The proponents of the WC advocate shrinking the size of government. The proponents of the EIP see reform in the organization of government in terms of the improved alignment of the interests of politicians and government bureaucrats with the development of markets. Roland also makes a very interesting association between “transition” (i.e., the passage from central planning to successful capitalism) and development (i.e., the process by which underdeveloped countries catch up with industrialised countries).\(^6\)

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\(^5\) Cohesion at the national level does not imply cohesion between the regions of a nation state, and the Commission’s stance can appear somewhat conflicted. For example, Barrios and Strobl, 2005, show that regional inequalities tend to rise when countries start developing, and then fall once a certain level of development has been reached as long as cross-region spillovers are strong enough.

\(^6\) Roland uses the term “transition” in the sense of post-Communist transition. But Ireland could be regarded as having made a “transition” during the period 1950-1972 from protectionism to free trade, where the resource misallocations that needed correction shared some characteristics with those of central planning. A similar
The debate on the role and utility of National Development Planning and Structural Funds has been fairly pragmatic, but that may be changing. Thus far there has been a politically acceptable consensus between the two extremes – the WC and the EIP. However, the main contributor state – Germany – is experiencing sluggish growth and is mired in the problem of integrating the East German regions. Furthermore, the dilemma faced by the new EU member states is that the case for a strategic co-ordinating role of government in the aftermath of liberalisation from more than a generation of failed Central Planning has, so to speak, been thrown out with the bathwater! It has not yet been fully accepted that the role of government as “strategic organizer” in a global economy driven by market forces is very different from the previous role of Communist governments as “central planners”. Government as “strategic organizer” carries out its functions in collaboration with private businesses and not as a substitute for the market economy. Unlike in the late 1980s, it has become more difficult to make a case in support of the EU concept of National Development Planning, with its Structural Fund aid-related policy instruments, as a logical and necessary stage in promoting accelerated convergence in the liberalised, but very poor, new member states.

National development planning and industrial strategy had been features of the post-war revival of Western Europe, which had been kick-started by Marshall Aid. But it had largely gone out of fashion in the West by the 1970s. On the other hand, in the CEE region, which had suffered the trauma and dislocation of almost 50 years of central planning in one form or another, liberalisation in the early 1990s was seen perhaps as a period when the state would take a back-stage role, and purely private sector initiatives would be the engine of economic reform and development. Within the dominant paradigm of liberal market economics, it was widely believed that no underdeveloped country was likely to remain disadvantaged permanently simply because it was late coming to the growth process. Nor could the established industrial powers block the development of a latecomer, provided that country played by the rules of economic liberalism. Any remaining failure by a state to grow and prosper was deemed to be self inflicted. This crude version of the Anglo-Saxon policy model took the view that all one had to do to promote real convergence (or “cohesion”) between groups of states was to put in place policies that facilitated the free movement of goods and the factors of production (i.e., labour and capital). If this was done, then orthodox theory asserted that factor incomes (wages as well as the returns on capital) would tend to converge to a common level across all nations in the group. So, if all markets were competitive, any initial national disparities would eventually vanish and there would be no need for specific structural regional policies.

By the late 1980s, when the EU began to get serious about trans-European regional development policies, the intellectual ground had begun to shift under the Anglo-Saxon model. Over the past two decades, three fields of economic research have undergone radical transformation: trade theory (Helpman and Krugman, 1985), growth theory (Grossman and

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7 The lack of success in dynamising the East German regions even after fifteen years of massive – and largely domestic - structural aid may also have turned German opinion against wider EU cohesion policy.

8 See Fukayama, 1992, p.103, for a political scientist’s view of this approach.

9 Real convergence (or cohesion) requires convergence in living standards. Nominal convergence requires convergence of inflation rates, interest rates, and public sector balances.
Helpman, 1991), and economic geography (Fujitsa, Krugman and Venables, 1999). The nature of the progress made has been summarized as follows:

“In each of these areas, we have gone through a progression that starts with models based on perfect competition, moves to price-taking with external increasing returns, and finishes with explicit models of imperfect competition”. (Romer, 1994, p. 19)

Advances in the study of spatial economic processes suggested that the conditions required for automatic convergence to take place do not always hold in practice (Krugman, 1995, p. 82). Rather, research attention began to be focused on the importance of such factors as the initial level of regional physical infrastructure, local levels of human capital, or on the fact that regions that start off at a structural disadvantage may never converge in any reasonable time period. Research even suggested that the removal of barriers to trade and factor movements might – in certain circumstances - actually lead to a relative deterioration rather than an improvement of some countries (Williamson, 1965; Krugman, 1987).

This was the intellectual background against which the EU reformed and expanded its regional policies in the late 1980s, into the so-called National Development Plans and their associated Structural Funds. The political rationale behind this reform came from the programme of market liberalization (or Single Market initiative of the then EC President, Jacques Delors), which dismantled all remaining non-tariff barriers within the Union (Cecchini, 1988). In doing so, there was a fear that not all EU member states were likely to benefit equally from the Single Market,. In particular, the less advanced, geographically peripheral economies of the southern and western Europe (mainly Greece, Portugal, Spain and Ireland, but including the Italian Mezzogiorno and - after unification - East Germany) were felt to be vulnerable. Today, it is the new member states of Central and Eastern Europe – almost all of which have levels of income per head less than half of the EU average - which may be at risk.

The main policies used in NDPs were the improvement of basic physical infrastructure, the enhancement of human capital, and certain targeted aids to the private productive sectors. The long-term nature of the EU investment aid – up to seven years – permitted domestic public investment policies to shift from a purely domestic process, buffeted by the short-term exigencies of maintaining balance in the public finances, to a more stable longer-term process that was carried out in co-operation with the European Commission. Of course, there continued to be a very natural desire to maximise national control over design, monitoring and evaluation of development policy. However, the ceding of some national policy autonomy to the Commission in Brussels seems to have generated minimal friction since the whole Structural Fund process was perceived to be a genuine partnership that allowed successive political administrations to break with the previous process of annual capital budgeting and put in place development plans of much longer duration, to finance them with far less difficulty in terms of increased public sector borrowing or taxation, and to benefit from trans-EU shared experiences in policy design, monitoring and evaluation..

At an abstract level of ideology the debate on the wisdom and effectiveness of National Development Planning has no clear resolution. On the one extreme one has the glossy brochures of the Directorate-General for Regional Policy, with colour pictures of new motorways and bridges, workers in training, and dynamic SMEs. On the other extreme, critics assert that the NDP process is riddled with absorption problems, wastage, inefficiency, dead-weight, and even illegality. It is only when one moves to the more technical attempt at
impact evaluation that one can begin to have a more constructive debate, based at least to some degree on empirical research.
3.1 Introduction

Strict monitoring systems were always mandatory for the Structural Funds, as well as the requirement to carry out ex-ante, mid-term and ex-post policy evaluations. Previous evaluation of domestic public investment programmes had often been secretive at best, and of mediocre quality at worst. The monitoring and evaluation aspects of Structural Funds served to promote and guide applied economic research agendas in Ireland and in Southern Europe since 1989, and are now doing so in the new member states (see Bradley, et al, 2004c for the recent case of Poland).

One of the principle ways that the Commission presents analysis of cohesion progress is in the so-called Cohesion Reports (CEC, 2004). These are comprehensive reviews of how cohesion processes are working in the EU states and regions, and present snap-shots at a given point in time of the economic and social health of the Union. But while they provide interesting descriptions of cohesion processes, and are suggestive of the role played by the Commission’s policies, they fall far short of actually demonstrating that the Commission’s cohesion policies are the root cause of any progress.

A possible interpretation of the style and content of the Cohesion reports is that Commission may believe that its policies are self-evidently effective, and that no proof – in terms of scientific evaluation – is really necessary. After all, who could possibly be against improving infrastructure, training workers and stimulating R&D? This might explain the very limited use made of empirical research in the Cohesion reports, and the neglect of studies that are overtly critical of cohesion policy.

The Cohesion reports provide almost no evidence-based justification for the Commission’s cohesion policy. To address this question requires a more analytic approach and an empirical methodology, and in the remainder of the section I look at a two-way classification of empirical methodologies: the “testing” versus the “impact evaluation” approaches.

3.2 “Testing” methodologies

There may well be convinced believers in the Anglo-Saxon model, who assert that Structural Funds are a distortion of market forces, and that the provision of physical infrastructure and human capital should be left completely to market forces. But this type of ideological critique – at least in its pure US libertarian form - tends to be rare in Europe, at least among economists. The criticisms that are advanced tend to be more subtle. Basically, they assert that Structural Funds are likely to produce few significant beneficial effects, and that most of the empirical studies that suggest otherwise are misguided at best (through the neglect of important mechanisms that serve to off-set positive impacts), and self-serving at worst (see Herve and Holtzmann, 1998, pp. 160-161).

We use the term “testing” methodologies to describe empirical research that attempts to examine if cohesion policies have detectable impacts on the progress of cohesion. More

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10 It is ironical that the Commission quotes results from the HERMIN-based ex-post evaluation of CSF 1994-99, even though these indicate that the increase in the levels of GDP by the year 1999 are very modest, and serve to underpin the cohesion objective only to a very small degree (see CEC, 2004, page 183, Table A4.6).
accurately, these methodologies usually posit a model of growth or industrial agglomeration, and test explicitly to see if structural funds have a statistically significant effect on growth or agglomeration. Two recent studies have been very influential in the debate on cohesion policy: Ederveen et al (2002a and b); and Midelfart-Knarvik & Overman, 2002.

An empirical critique of EU cohesion policy has been advanced recently in two papers published by the Dutch CPB (Ederveen et al, 2002a and b). They make the perfectly valid point that when macro models are used to evaluate Structural Fund impacts on cohesion, they tend not seek to establish if there is a positive impact on the cohesion objective due to the policies. Rather, they characterise model-based research on Structural Fund policy impacts as “imposing” the results. One line of research critiqued by the CPB team is that of the QUEST and HERMIN-based evaluations (see Bradley et al, 2004(a) and (b)), which will be examined later. But in the modelling literature, any imposition of impacts is not arbitrary and draws on a large and authoritative research literature and imposes impact elasticity values that are consistent with this literature.

The approach to testing the impact of Structural Funds used by Ederveen et al (2002a and b) is to set up Barro-type growth regressions (Barro and Sala-i-Martin, 1995) and augment them with Structural Fund variables. Thus, the basic Barro-type regression will have growth of GDP as the dependent variable and the initial level of GDP per head, the domestic savings rate, population growth, etc., as independent variables. They insert the Structural Fund expenditures into such a model and seek to estimate statistically significant and positive coefficients. Using a pooled cross-section regression, with thirteen EU countries in the data set and seven five-year periods from 1960-65 through 1990-95, they fail to find any statistically significant Structural Fund effect. Perhaps this is not very surprising, since they examine a wide range of countries, some of which received very little aid, and deal with a time period that stretches from the mid-1960s to the early 1990s. It should be noted that the level of Structural Fund investment aid was very low prior to 1989, and was only expanded massively after that. However, when they add a “conditioning” variable (such as openness, institutional quality, corruption index, etc.), their analysis suggests that a few countries like Ireland did benefit from an increased growth rate that was associated with the Structural Funds.

The Ederveen et al approach suffers from the fact that it posits a model where the only Structural Fund impact looked for is one on the growth rate. In most of the sample of thirteen EU countries and for most of the sample period 1960-95, the regional aid was trivially small, and was very unlikely to affect the growth rate, even temporarily. The macro-model-based impact evaluations (to be described below) usually posit a less stringent “levels” effect, and draw on the international literature to support this assumption. Such evaluations usually pick up long-term levels effects (see Bradley et al, 2004b for references). If the CPB approach were to be restricted to the poorer EU member states, and excluded such high income countries as Denmark, Sweden, the Netherlands, France, etc., then significant effects on growth might reasonably be sought. However, the panel regression technique requires a wide range of countries, which frustrates application of the technique to lagging countries in isolation.

The second example of a “testing” methodology by Midelfart-Knarvik and Overman, 2002, focuses on examining the role of structural funds on industrial location, and in particular on attracting industries that are intensive in R&D activities. In the absence of government
intervention, location patterns will be driven by the interplay between agglomeration and dispersion forces. To test these processes, they posit an empirical model of the form:

\[
\text{change in share of a country in an industry} = f(\text{change in size, change in country characteristics, industry characteristics, flow of total EC aid, flow of domestic state aid to manufacturing})
\]

Changes in national production structures are studied between two periods: 1990-93 and 1994-97, where four-year averages remove business cycle effects. Examination of changes in regional structure were more limited by data problems. The main qualitative findings are as follows. Changes in industrial structure are only weakly related to changes in endowments and the role of comparative advantage – differences in endowments – has not increased markedly between the two periods 1990-93 and 1994-97. This problem is reinforced by EU policy interventions that attract R&D intensive industries to locations without large endowments of high-skilled labour. In other words, EU aid distorts the location of R&D-intensive industries, attracting them to countries without the right endowments of high-skilled workers. This occurs even if EU aid is “horizontal” (i.e., independent of sector), since industries vary with respect to the intensity with which they benefit from the aid.

Curiously, Ireland is also an outlier in Midelfart-Knarvik and Overman’s results, due mainly to the large investment in education that preceded the arrival of EU aid. Ireland became more specialized as a result of both state and EU aid than it would have been without them. The authors conclude:

“Ireland’s policy ‘worked’ because state and EU expenditures reinforced its comparative advantage and encouraged appropriate structural change rather than inhibiting it” (op. cit., page 349)

The overall conclusion is that the Commission should focus attention on why changes in endowments do not appear to be feeding through to changes in production structure. In particular, EU aid should be focused on helping regions change their endowments and specialize according to the resulting comparative advantage. Member states should be encouraged to remove factor price distortions that prevent dispersion as a result of differences in comparative advantage. Finally, efforts should be made to increase internal mobility to achieve the most favourable outcome of a concentration of workers, capital and firms.

These two examples of “testing” methodologies serve to illustrate the role for the approach. The underlying cohesion processes are probably too complex to be tested in the way the Ederveen et al propose. Only when one looks at cohesion processes in the detailed sectoral way used by Midelfart-Knarvik and Overman is it possible to draw conclusions that can be used to evaluate the role of EU cohesion policy initiatives. And when one does so, it becomes clear that there can be contradictions between the Commission’s desire to seek national and regional cohesion simultaneously.
3.3 “Impact evaluation” methodologies

Given the size of the SFs in relation to the size of the economy, and the obvious implications for domestic fiscal policy, it is necessary to examine their impact in a context that includes economy-wide feedbacks and interactions, attempting to account for spillover effects and externalities. Here one needs to make use of formal national or regional economic models: input-output, macro-econometric, computable general equilibrium, dynamic growth models, etc. Since its inception, analyses of the aggregate impact of SFs were carried out to some extent at least using all four of the above model types, the earliest examples being: (I-O) models (Beutel, 1993); macro-econometric models (Bradley, Fitzgerald and Kearney, 1992); CGE models (Bourguignon et al, 1992); and dynamic growth models (Gaspar and Pereira, 1991). All of these approaches have particular strengths and weaknesses. Although there was potentially a wide range of model types suitable for aggregate SF analysis, the actual state of availability of national empirical models in the four main Objective 1 countries was far from ideal in the late 1980s.

The new breed of macroeconomic models of the late 1980s had addressed the theoretical deficiencies of conventional Keynesian econometric models (Klein, 1983). However, policy analysts were still faced with the dilemma of having to use conventional models, calibrated using historical time-series data, to examine future structural changes. The Lucas critique was potentially a serious threat to such model-based policy evaluations, and called for carefully designed model. The relationship between public investment policies and private sector supply-side responses - processes that were at the heart of the SFs - were not generally incorporated into macro models prior to the 1990s. Earlier Keynesian-influenced models tended to focus on the demand-side boost of public expenditure.

The revival of growth theory in the mid-1980s provided guidelines to the complex issues involved in designing policies to boost a country’s growth rate, either permanently or temporarily (Barro and Sala-I-Martin, 1995; Jones, 1998). But empirical growth studies tended to be predominantly aggregate and cross-country rather than disaggregated and country-specific. Yet another complication facing SF analysts was that the first four main beneficiary countries - Greece, Ireland, Portugal and Spain - were on the geographical periphery of the EU, thus introducing spatial issues into their development processes. With advances in the treatment of imperfect competition, the field of economic geography had also revived during the 1980s (Krugman, 1995; Fujita, Krugman and Venables, 1999). But the insights of the new research were confined to small theoretical models and seldom influenced the large-scale empirical models that are needed for realistic policy analysis.

The need to analyse SF policies pushed evaluation into areas which were still at the frontiers of economic research, requiring fresh ways of translating the insights of new growth theory into modelling the long-term impacts of investment in infrastructure and human capital. For such model-based macro evaluation to be credible required it to be presented transparently, in terms of the logical chains of causes and effects illustrating how SF policies achieve their

11 With carefully designed macro models, one can examine the difference between performance “with” Structural Funds, and performance “without”. By “carefully designed” we mean structural models, where policy-induced changes in structure are explicitly modeled. Such models are less susceptible to the so-called Lucas critique of reduced form time-series models (Lucas, 1976).

12 Fischer, 1991 suggested that identifying the determinants of investment, and the other factors contributing to growth, would probably require a switch away from simple cross-country regressions to time series studies of individual countries.
stated cohesion goals. For example, this was the context that gave rise to the HERMIN modelling initiative in Ireland, one of the more sustained efforts to explore the likely impacts of SF policies. Since the difficulties and challenges of using macro models for SF analysis are common to all models, we use HERMIN as a case study (see Bradley et al, 2004a).

3.3.1 Model structure

The HERMIN macro model framework, developed in Ireland in the late 1980s specifically to evaluate the macro impacts of SFs, drew from the above revision and renewal of macro economic modelling. HERMIN was designed to take account of limited data availability in the less-developed EU member states and regions (i.e., Greece, Ireland, Portugal, Spain, the Italian Mezzogiorno, East Germany and Northern Ireland). The design of HERMIN was based on a simple theoretical framework that permitted inter-country and inter-region comparisons and facilitated the selection of key behavioural parameters in situations where sophisticated econometric analysis was difficult.

HERMIN was designed for analysis of medium-term policy impacts involving large-scale public investments in physical infrastructure and human resources. Such analysis requires specific structural features in a model: an appropriate level of sectoral disaggregation; attention to links between the lagging economy and the wider EU drivers of its future growth; and acknowledgement of the limited usefulness of past data in calibrating a model of an economy that is undergoing major structural change.

The main features appropriate for a model of long-term policy impacts include:

(i) The use of annual data, since quarterly data are not essential in order to study the longer-term impacts of cohesion policy and structural change;

(ii) A multi-sector production structure of the country/region receiving EU aid, with a minimum level of disaggregation into manufacturing, building & construction, market services, agriculture and non-market (or public) services;

(iii) The use of an integrated factor demand system in manufacturing, building & construction and market services, in order to impose a degree of micro-structure on the behaviour of firms. The imposition of micro-structure is needed to ensure predictable long-term model responses takes precedence over a high degree of “within-sample” tracking.

In the short term, conventional Keynesian mechanisms are at the core of the model framework. Expenditure and income distribution sub-components generate the standard income-expenditure mechanisms and multipliers. It is through these Keynesian mechanisms that the implementational phases of cohesion policy operate (e.g., during the period 2007-2013, in the case of the next programming period).

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13 The origins of HERMIN lay in the complex multi-sectoral HERMES model that was developed by the European Commission from the early 1980s (d’Alcantara and Italianer, 1982). It was intended to learn from HERMES, incorporate many of its structural features, but be of more modest scale. In other words, it was a minimal version (HERmes MIMinimal).

14 See Bradley et al, 2004(a) for technical details of the HERMIN model.

15 Agriculture is not as amenable to treatment using a purely commercial profit-driven model, and public services are usually treated in terms of policy instruments.
But the model also has medium-term, neoclassical features. Thus, output in manufacturing is not simply driven by demand. It is also potentially 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 using the 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. The post-implementation phases of cohesion policy operate through, and also augment, these supply-side, neoclassical mechanisms.

However, the HERMIN-based research pointed to areas where the quality of the modelling needs to be improved. The main areas are as follows:

(i) Although the older HERMIN model contains a highly structured version of the theory of the firm (in its imposed joint factor demand system and CES production function constraint), it does not handle the issue of foreign direct investment (FDI) explicitly. An extended model framework will need to incorporate an explicit model of the mechanisms of FDI, which have proved so important in many of the new member states.

(ii) The previous HERMIN models did not have a monetary sector, and treated exchange rates and interest rates as determined outside the model system. Even in the pre-EMU era, this was an adequate representation of the Irish policy realities, but it is not as adequate in the case of other countries. A separate monetary sector will be needed for some country models, endogenising interest rates and exchange rates.

(iii) Modelling of the labour market is basic, and only the Irish HERMIN model contains explicit treatment of international migration. In light of the migration behaviour in some of the new member states, the migration mechanism needs to be made an integral part of the structure of the models of the new EU member states.

(iv) In addition to the explicit modelling of the impacts of European Social Fund (ESF) cohesion programmes on human capital, a more disaggregated approach to modelling labour inputs, in terms of skill and education levels may be necessary.

(v) There are a range of other areas where improvements and extensions of the original HERMIN system are needed. These include the need for a more systematic approach to the calibration of the models of the new member states (the post-Communist ones), where data sample sizes are too small to permit the use of formal econometric estimation and hypothesis testing.

3.3.2 Model “calibration” in the presence of structural change

The dramatic nature of structural change in the “old” EU cohesion economies (such as Ireland and Greece) suggests that the data sample for calibrating the model should be restricted to the post-1980 period. In the case of the transition economies of Central and Eastern Europe (CEE), data constraints require one to work with only about ten annual observations for the period 1994-2003, since data prior to 1989 are unusable and data prior to 1994 are incomplete and not very reliable. The small number of available observations excludes sophisticated econometric estimation and hypothesis testing techniques commonly used to calibrate macro
models. Consequently, three different approaches to model calibration (or estimation) are used in the literature of modelling the transition economies of the CEE region.

(i) First, there is a temptation to make use of data from the pre-transition era. The disadvantage is that the extended data sample covers three very different economic regimes: the era of communist economic planning; the years immediately following the collapse of the communist economic system; and the era of rapid recovery and growth that followed the post-communist collapse.

(ii) Second, a series of CEE databases can be assembled for the post Communist era, a generalised model posited that is appropriate to each of the constituent economies, and cross-economy constraints imposed (e.g., a common marginal propensity to consume). This has the advantage of increasing the degrees of freedom and obtaining more precise parameter estimates. A disadvantage is that the cross-economy restrictions are difficult to test, and may be inappropriate.

(iii) Finally, a generalisation of the CGE approach can be used, and this is the approach used for the CEE HERMIN models. By keeping the behavioural equations very simple, the number of behavioural parameters can be kept to a minimum. Using ordinary least squares, a form of “curve-fitting” is used, where the derived parameters are examined and related to a range of estimates from other EU models, where longer data sets are available. In its extreme form, using one observation, this reduces to the way in which computable general equilibrium (CGE) models are calibrated, by imposing all important parameters. Advantages of the “curve-fitting” approach include the tight theoretical control imposed on the model, the use of the most recent and consequently, most relevant data sample, and the use of judgement to ensure the relevance of the parameters. Disadvantages are numerous and include a complete lack of formal hypothesis testing.

Two wider issues arise in the case of CEE macro models for SF evaluation. First, the standard macroeconomic interrelationships that characterise “old” EU economies may already exist in some of the more advanced CEE economies such as the Czech Republic and Slovenia. Thus, producers are sensitive to international cost-competition; wage determination mechanisms have become consistent with the need to maintain a cost-competitive position in the global economy; the financial system is sufficiently well developed to permit households to smooth their consumption activities through borrowing. But these macro-structural mechanisms may simply be too recent and we may have too few data observations to isolate the magnitudes of the relevant elasticities and parameters.

Second, it may be the case that these interrelationships are not yet fully developed, but will develop in the immediate future after the CEE economies become EU members. Unless one wants to use the highly specific models of the first stages of the transition process, one may have to construct a model of the structure towards which the economy is converging, drawing on existing research from other market economies. Consequently, the experimental and speculative nature of such models must be kept in mind and policy simulations regarded as exploratory (Barry, et al, 2003).

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16 For the Polish W8-2000 model, data for the period 1960-1998 are used (Welfe et al, 2002).
17 The panel approach is used within the CEE models contained in the NIGEM model of the world economy developed by the London-based NIESR (Barrell and Holland, 2002).
18 See Blanchard, 1995 for special models of transition economies.
3.3.3 Incorporating cohesion policy instruments and mechanisms

In model-based impact analysis, the Structural Fund investment measures and their constituent Operational Programmes (OPs) are usually aggregated into three main economic categories:

(i) Investment expenditures on physical infrastructure;
(ii) Investment expenditures on human resources;
(iii) Expenditures on direct production/investment aid to the private sector.

For each of these categories, there are three possible sources of funding: EU transfers in the form of subventions to the domestic public authorities; domestic public sector co-financing, according to the regulations in place at the time; and domestic private sector co-financing.

Structural Fund actions in the form of public investments influence the economies 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 SF policy initiatives. Through “multiplier” effects there will 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 of transitory importance and are not the raison d’être of Structural Funds. Rather, the SF interventions are intended to influence the long-run supply potential of the economy.

The “supply-side” effects of SFs arise through policies designed to improve the stock of physical infrastructure as an input into private sector production; to increase the stock of human capital, through investment in training and education, as an input to private sector productive activity; and to 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. SF interventions are designed to improve the aggregate stock of public infrastructure and human capital, as well as the private capital stock.

Providing more and better infrastructure, increasing the quality of the labour force, or providing investment aid to firms, are the mechanisms through which the SFs improve the output, productivity and cost competitiveness of the economy. The longer-run effects of these policies are to create conditions where private firms enjoy the use of improved factors of production, sometimes at no cost to themselves. Alternatively, they may help to make the current private sector inputs that firms are already using available to them at a lower cost, or the general conditions under which firms operate are improved as a consequence. In all these ways, positive externalities may arise out of the SF interventions (see de Melo and Robinson, 1992).

The modelling challenge is to be able to relate these improved stocks to possible benefits in terms of increased output growth and productivity. Recent advances in growth theory have addressed this issue (see Barro and Sala-I-Martin, 1995). The fruits of this research can be incorporated (or “grafted”) into structural macro models in the form of spillover or externality mechanisms which arise from sustained public investments in infrastructure or in human capital.
Two main types of beneficial externalities are likely to enhance the impacts of well designed SF investment and training initiatives. An “output” externality will be associated with the role of improved physical infrastructure and of training in boosting private sector output directly. This works through mechanisms such as attracting productive activities in manufacturing through foreign direct investment, and enhancing the ability of indigenous industries to compete in the international market place.

A “factor productivity” externality arises through increased total or embodied factor productivity associated with improved infrastructure or a higher level of human capital associated with training and education. Of course, a side effect of increased factor productivity in the highly restrictive context of fixed output, is that labour is shed and unemployment rises. The prospect of such “jobless growth” is particularly serious in lagging economies where the recorded rate of unemployment as well as the rate of hidden unemployment are already high. Thus, a factor productivity externality 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, factor productivity is driven up, real incomes rise, and these effects cause knock-on multiplier and other benefits throughout the economy.

An indication of the likely numerical values of the elasticities associated with the above sectoral externality mechanisms can be obtained from a review of the extensive international research literature in this area (see Bradley, Morgenroth and Untiedt, 2002). Since research does not always exist for the lagging Objective 1 and CEE countries, one is forced to utilize results from analogous or more advanced economies. However, sensitivity analysis can be carried out over a plausible range of values of the externality elasticities.

How enduring are the beneficial externality effects likely to be? The infrastructure deficit in the Objective 1 countries is quite large, and is unlikely to match up to the level pertaining in the more developed EU countries until well into the future. Given this and the fact that there are substantial returns to the elimination of bottlenecks which will take some time to accomplish, it is unlikely that diminishing returns will set in.

3.3.4 Debates within the modelling community

A criticism could be made of the HERMIN analysis that the short-term impacts are overstated. This centres on the fact that the policy-crowding out mechanisms in HERMIN are weak, since no balanced budget constraint is imposed, labour market tightening may be understated due to the difficulty of calibrating Philips curve effects in wage bargaining, and the exogeneity of monetary policy means that the exchange rate and interest rates remain fixed, even in the face of a big fiscal expansion and productivity improvements.

A wide range of other criticisms of model-based cohesion policy evaluation studies has been made by Herve and Holtzmann (1998). They provide a comprehensive theoretical exposition of all the potential pit-falls of Structural Funds (absorption difficulties, rent-seeking, endogenous consumption-investment decisions, sub-optimal policy choices, Dutch disease, immiserising growth, polarisation effects, labour market distortions, etc.). But they do not produce any firm empirical evidence that these potential problems actually occurred in practice in any specific country or regional cohesion policy programmes. In other words, according to their view, the possibility that cohesion policies could fail in “theory” implies
that they will actually fail in “practice”, and any empirical work that neglects these issues is invalid and possibly self-serving (op. cit., pp. 161).

Nevertheless, the criticisms of Herve and Holtzmann need to be taken seriously. For example, previous experimentation with the Irish HERMIN model indicated that the incorporation of a budget constraint, as well as some model-consistent expectation mechanisms, served to lower the size of the Keynesian multipliers associated with a fiscal expansion (Bradley and Whelan, 1997). The eventual inclusion of fully articulated monetary sectors will permit the investigation of monetary crowding out. One must examine all possible ways in which the implementation (or Keynesian) multipliers could be over-stated.

Turning to the longer-term post-implementation effects, research in this area needs to focus on issues such as:

(i) How the concept of stocks of physical infrastructure and of human capital can be refined beyond the rather crude measures currently used in HERMIN. In particular, it is important to improve the quantification of the initial (or pre-cohesion policy) stocks, so that the changes induced by the cohesion investments are of the correct size relative to the initial state.

(ii) The previous HERMIN model used one measure of physical infrastructure and one of human capital, based on the accumulation of real investments (in the case of infrastructure) and the number of trainee-years produced (in the case of human capital). Perhaps one needs to disaggregate the two kinds of investment into homogeneous sub-sets (e.g., roads, rail, ports, telecommunications, in the case of infrastructure) and social as distinct from productive training in the case of the ESF programmes.

(iii) An effort needs be made to relate the presently used “real investment expenditure”-based proxy measures (i.e., inputs) to actual ex-post measures that are based on outputs (kilometres of roads, of rail, capacity of telecommunication networks, etc.). However, it must be stated that the recent ex-post evaluation of CSF 1994-1999 for the Objective 1 countries and regions produced very little by way of these “output”-based performance measures that could be used in systematic research into long-term policy impacts.

(iv) More generally, further research is needed on the labour market consequences of total factor productivity (TFP) growth, on a more focused approach to direct aid to the private sector (possibly linking to the Lisbon Agenda goals), and deeper examination of the lags in the supply effects of cohesion aid.

(v) The final challenge to be addressed concerns the optimum balance between cohesion-financed investment in physical infrastructure, human resources and direct aid to firms. Almost nothing is known in this field, and past impact analysis simply uses given packages of measures without addressing the issue of the optimality of policy design.

Within the literature of policy impact evaluation using structural macro-models, there are also differences of emphasis. The other main model that has been used for cohesion policy analysis is the Commission’s own model, QUEST. This is a sophisticated neo-Keynesian model with forward-looking (or model consistent) expectation mechanisms (Röger and in’t
Veld, 2002). In such models one tends to get strong policy crowding out caused by the anticipation of tax increases in the future to pay for public investment in the present. Any impact analysis based on QUEST tends to show very small effects of Structural Funds on GDP, just as they show negligible effects of any tax-financed public expenditure.

But a case can be advanced that this kind of crowding out is not a reasonable assumption in the lagging economies which are the main beneficiaries of EU investment aid. First, such economies tend to be operating well below full capacity. Second, the public expenditure involved is on public goods that provide direct inputs into private production processes, where the returns to the investments are almost all private, and where there are likely to be significant positive externalities involved. Third, the direct EU aid element of the Structural Funds lessens the tax burden, and revenue buoyancy offsets some of the deterioration in the public sector borrowing requirement.

The analysis of SF impacts over the past decade and a half suggests that models are potentially capable of extracting the pure SF impacts from the background of all the other domestic and external shocks that affect the economy at the same time. However, model-based analysis tends to suffer from the “black box” problem, where the answers given by the modellers to the policy makers are surrounded by caveats and special assumptions, and can be as complex than the original questions. Strengths of the model-based approach include the analytical framework used to represent the economy; the ability to quantify feed-backs and policy linkages; and the ability to rank different policies in terms of their impacts on economic indicators like GDP per capita. Difficulties with the model-based approach include the costs of building and maintaining models, the need to step outside the purely macroeconomic framework in order to identify and design the primary SF impact channels, and the need to rely on inadequate results from micro-studies in order to quantify these mechanisms.
4.1 Evaluating SF policy impacts

The dilemma facing policy analysts, particularly when they use macro models to evaluate the ex-ante impacts of Structural Fund programmes, is that they usually lack knowledge of how appropriate or optimal is the design of the SF in addressing a country’s future development challenges. More seriously, they cannot anticipate how effectively the SF investment programmes will eventually be implemented. At best, they can arrive at an informed qualitative judgement on the appropriateness of the SF, 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 SF-like investment programmes. The insistence by the Commission that strict monitoring checks be observed helps towards more effective implementation, but cannot guarantee it.

During SF implementation, investment expenditures are a flow (the expenditure of \( x \) euro per year). But their cumulative impact is to cause 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.\(^{19}\)

It is these increases in the stock of physical infrastructure and of human capital that can generate spill-over benefits for the rest of the economy, mainly in terms of increased output and higher productivity. To model the magnitude of these spillovers, HERMIN-based analysis needs to know the approximate values of four parameters: \( \alpha_1 \), \( \alpha_2 \), \( \beta_1 \), \( \beta_2 \), where:

<table>
<thead>
<tr>
<th>Increase</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% increase in the stock of infrastructure raises output by ( \alpha_1 )%</td>
<td>( \alpha_1 )</td>
</tr>
<tr>
<td>1% increase in the stock of infrastructure raises productivity by ( \alpha_2 )%</td>
<td>( \alpha_2 )</td>
</tr>
<tr>
<td>1% increase in the stock of human capital raises output by ( \beta_1 )%</td>
<td>( \beta_1 )</td>
</tr>
<tr>
<td>1% increase in the stock of human capital raises productivity by ( \beta_2 )%</td>
<td>( \beta_2 )</td>
</tr>
</tbody>
</table>

Based on an exhaustive review of the literature, one can bracket the upper and lower bounds and define the average values for the characteristics of the recipient economies (see Bradley, Morgenroth and Untiedt, 2002 for details). The range of elasticities (output elasticities of between 0.0 and 0.4, and productivity elasticities of between 0.0 and 0.2) are found in the literature. More is known about the role of infrastructure than about human capital (Sinaesi and van Reenen, 2002). A further crucial question is that of the interaction between infrastructure and human capital. However, these links have yet to be investigated in the new growth literature, and SF analysts can say very little about them or about the likely optimum

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\(^{19}\) See Bradley et al (2004b) for a discussion of how the SF investments lead to accumulated stocks of infrastructure and human capital.
balance of expenditure within a SF programme as between physical infrastructure and human resources. Determining this balance remains more an art than a science.

4.2 How should Structural Fund macro impacts be presented?

The key stages in a model-based SF analysis are as follows:

(i) The aggregation of the wide variety of SF programmes from the administrative categories used by the policy makers into categories related to the key economic mechanisms, i.e., physical infrastructure, human resources, productive structures;

(ii) Definition of a suitable benchmark simulation for the economy in the absence of the SFs but with explicit assumptions about other policies like the Single Market, the Common Agriculture Policy, EMU, WTO, etc.;

(iii) Analysis of the standard Keynesian impacts of the SF programmes, tracing out the impacts of domestic and EU financed investment expenditures on aggregate demand and the public sector finances, combined with quantification of the long-term supply-side impacts of the SF programmes, working through factor productivity and cost mechanisms;

(iv) Quantification of the total SF impacts in terms of deviations from the benchmark simulation.

Each of the above four stages involves quite complex explicit and implicit assumptions and choices. The innovation in the early Irish SF evaluation was the admittedly crude distinction made between transitory demand-side impacts and possibly enduring supply-side effects (Bradley et al, 1992). Of course, there remains a high degree of uncertainly concerning the appropriate rate-of-return assumptions implicit in the choices of externality elasticities.

We illustrate the process of reporting SF impacts using a recent study, which examined proposals for the forthcoming SF programme that will cover the years 2007-2013. In the absence of any information to the contrary, we make the assumption that the SF programmes in each country/region have equal design and implementation effectiveness. Translated into model terms, this requires the use of identical SF externality mechanisms as well as identical elasticities, which are key influences on the longer term supply-side impacts of higher levels of the stock of physical infrastructure and of human capital. Consequently, the simulation outturns can only differ because of different SF magnitudes, and if the underlying HERMIN models for the different countries have different properties, due to the different sectoral structures in the economies being studied, the differing degrees of openness, the different calibrated parameter values in the HERMIN behavioural equations, etc.

While the Structural Fund investment expenditures are being made, and the stocks of physical infrastructure and human capital are increasing, the growth rate of GDP increases above the

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20 See Bradley, et al, 2004(b) for full details. This report also contains a full set of references to SF evaluations using the HERMIN models since 1989.

21 The assumption of equal SF design and implementation efficiency for all countries is clearly unrealistic, based on examination of SF studies carried out since the late 1980s. We merely make it in order to isolate the underlying economic structure aspects of each country/region that will condition SF impact efficiency into the medium term. A sensitivity analysis on the externality elasticities can be used to explore the consequences of differences in design and implementational effectiveness.
Models can be used to evaluate policy impacts on a wide range of target variables. But in what follows we focus on GDP, and only present summary results. The goal of the SFs is to promote long-term convergence. Hence, the transient “demand” effects that arise during the seven-year implementation phase are of less interest than the enduring longer-term benefits. We take the year 2020 as the terminal year for the simulations, i.e., seven years after the 2007-2013 programme will terminate. We summarise the long-run impacts on the level of GDP that were derived from all models in Table 2 below, where we have ranked them in order of decreasing impact.

| Table 2: Increase in the level of GDP by year 2020 (% change over “no-SF” baseline level) |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Czech Republic                  | Hungary         | Estonia         | Poland          | Slovenia        | Romania         |
| 2020                            | 4.4             | 4.1             | 3.7             | 2.7             | 2.08            | 1.7             |
| Portugal                        | Latvia          | Mezzogiorno     | Spain           | Greece          | East Germany    |
| 2020                            | 1.7             | 1.4             | 0.7             | 0.3             | 0.3             | 0.15            |

In the absence of any permanent increase in the GDP growth rate, the actual impacts of SF 2007-2013 as simulated in the HERMIN models might appear quite small. What Table 2 asserts is that, in the case of the Czech Republic, the level of GDP in the year 2020 will be 4.4 per cent higher than the level that it would have been in the complete absence of SFs, and in the absence of any other policy changes (such as compensating domestic policy initiatives in the area of public investment). Since the “new” member states have levels of GDP per head that are between 35 and 55 per cent of the EU average, these would represent rather modest convergence steps.

Another useful summary measure of the likely return from SF investment expenditures is given by a “cumulative” multiplier, which attempts to capture the continued (if modest) semi-permanent increase in the level of GDP that should persist after the policy is terminated in the year 2013. Since SF supply-side impacts build up gradually over time, we need to use the accumulated change in GDP relative to the no-SF baseline. But to remove the effect of the size of the SF injection, we can normalise the SF injection to 1 per cent of baseline GDP. So, the definition of the cumulative SF multiplier is as follows:

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22 The “no-SF” baseline usually assumes that the domestic authorities do not implement a domestically financed alternative. Other more realistic baselines could be used.
23 The stocks on physical infrastructure and human capital eventually decay due to depreciation, but this is a second order effect. See Sianesi and van Reenen, 2002, for a discussion of “level” versus “growth rate” impacts of investment in human capital.
24 The interested reader is directed to the report prepared for DG-REGIO, which is available on the Commission web site (Bradley et al, 2004(d)).
The cumulative SF multipliers for the full period 2007-2020 are shown in Table 3, where we have ranked them in order of decreasing size.

Table 3: Structural Fund (2007-13): Cumulative multipliers

<table>
<thead>
<tr>
<th>Year</th>
<th>Czech Republic</th>
<th>Slovenia</th>
<th>Estonia</th>
<th>Poland</th>
<th>Portugal</th>
<th>Latvia</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2020</td>
<td>2.8</td>
<td>2.5</td>
<td>2.4</td>
<td>2.4</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Romania</td>
<td>Spain</td>
<td>Hungary</td>
<td>East Germany</td>
<td>Mezzogiorno</td>
<td>Greece</td>
</tr>
<tr>
<td>2007-2020</td>
<td>1.8</td>
<td>1.7</td>
<td>1.6</td>
<td>1.2</td>
<td>1.1</td>
<td>0.9</td>
</tr>
</tbody>
</table>

The case of the Czech Republic is illustrated in Figure 1, where we show the evolution of the accumulated total SF injection, expressed as a percentage of Czech GDP. The SF programme is assumed to cease at the end of 2013, and after that the accumulated total stays fixed at its end-year 2013 value of 34 per cent of GDP. Thus, the annual SF injection is about 5 per cent of GDP per year, for five years.

In Figure 1 we also show the evolution of the accumulated percentage increase in the level of Czech GDP caused by the SF shock. This starts off in year 2007 as slightly smaller than the SF injection, i.e., the impact multiplier is slightly smaller than unity. But it grows faster than the SF injection over time, under the influence of the Keynesian multiplier (during the implementation years, 2007-2013), and under the output and productivity-enhancing influence of the rising stock of infrastructure and human capital. This latter effect endures after the implementation phase is over and the cumulative multiplier rises to 2.8 by the year 2020.

\[
\text{Cumulative SF multiplier} \Rightarrow \frac{\text{Cumulative } \% \text{ increase in GDP}}{\text{Cumulative } \% \text{ SF share in GDP}}
\]
In interpreting the above cumulative multipliers, two caveats need to be borne in mind. First, we have assumed values for the “spillover” parameters that are in the mid-range of values found in the international literature. Higher values would give higher multipliers; and lower values, lower multipliers. Second, the depreciation rates that we have assumed for the stock of physical infrastructure and human capital (2.5% and 5%, respectively) are probably on the low side. If these were higher, then the cumulated multiplier would level off a few years after the 2013 termination date, and start to decline.

Table 3 suggests that the 2007-2013 SF recipient countries are likely to fall into three separate groups:

Group 1: Star performers, with cumulated SF multipliers of between 2.0 and 2.8. This includes the Czech Republic, Slovenia, Estonia, Poland and Portugal. For these countries, the returns from SF investments are high.

Group 2: Average performers, with cumulated SF multipliers of between 1.6 and 2.0. This includes Latvia, Romania, Spain and Hungary.

Group 3: Under performers, with cumulated SF multipliers near unity. This group includes East Germany, the Italian Mezzogiorno and Greece. For these countries/regions, the returns from SF investments are low.

In all the above model simulations we have used a common set of “average” “spillover” parameters, so the difference in performance must originate in differences in the underlying structures of the economies in question. If the assumed sizes of the “spillover” parameters differed from country to country – thus capturing qualitative differences in design and implementation efficiency – , the ranking in terms of size of cumulative multiplier would change. But in light of the problems of modelling in Eastern Europe, perhaps it would be unwise to read too much into the differences between the star and the average performers.

It must be stressed that our analysis is not “bottom up”, in the sense of working from very detailed SF measures, up to Operational Programmes, and finally up to the aggregate effects. In fact, only three pieces of SF data are used that can influence the size of the cumulative multipliers: the distribution of EU funds between investments in infrastructure, human capital and direct investment aid to the productive sectors. The actual size of Structural Fund injection is filtered out by the normalization involved in the calculation of the cumulative SF multiplier. In reality, everything will depend on the actual mix of projects in the NDP, as well as the organizational ability to utilize and implement SF efficiently and effectively. So, our model-based macro results are merely broad ball-park estimates. The real challenge is to reconcile the bottom-up micro analysis with the top-down analysis (see Bradley et al, 2005).
Towards more rational cohesion policy analysis

The finding that the benefits from SFs in isolation are modest draws attention to the fact that the real long-term benefits of the SFs are more likely to be associated with the way in which each of the lagging economies responds to opportunities arising in the rest of the EU and world rather than with the direct implementation impacts of the SF in isolation. This emphasises the need to work within the wider “global theory” of macro modelling rather than the narrower “theory of action” that tended to motivate policy makers who were focused on specific programmes (Monnier and Toulemonde, 1993). The use of externality mechanisms associated with improved stocks of infrastructure and human capital represent a crude attempt to do this.

Contributions to the debate on cohesion policy has tended to fall into three distinct types. The “descriptive” approach is typified by the Commission’s regular Cohesion Reports, where the cohesion process is described in great detail, but no effort is made to quantify the role of the its own cohesion policies. The “sceptical” approach starts off in a spirit of agnosticism, and invokes econometric techniques to test for any statistically significant role for EU cohesion policy. The “technical” approach invokes the large international literature on the role of public expenditure on infrastructure and human capital to justify returns to these investments, and seeks to use structural macro and other models to trace out and quantify how these processes cause restructuring and growth.

The problem is that the “descriptive”, “sceptical” and “technical” discussions and debates have tended to be carried on by different groups, who have not communicated well with each other. The Commission’s Cohesion Reports have failed to draw lessons from the “testing” and “technical” debates. The Directorate-General with responsibility for cohesion policy appears to focus very narrowly on the role of structural and cohesion funds, to the exclusion of how these policies interact with the wide array of other forces that drive growth, change and convergence. The “sceptical” strand of the debate has thrown up very useful insights, as small-scale models are designed to illuminate cohesion processes. But there is a tendency to rush to (an often negative) judgement, even when the data quality is poor, sectoral detail missing, and the time scale over which structural change is examined is excessively short. The “technical” strand of the debate, in an effort to trace the possible impacts of cohesion policy through the different sectors of the economy, and produce plausible impact quantification, tends to lose sight of the fact that results are very sensitive to the assumptions made in their models and the modest ability to calibrate these models where data are scarce and structural change rampant.

But in a sense, these debates may be missing the point. They focus exclusively on an economic perspective and the debate is essentially about the rate of return on investment. With carefully designed macro models, one can examine the difference between performance “with” Structural Funds, and performance “without”. Such evaluations tend to give rise to relatively modest boosts to cohesion (Bradley et al, 2004d). The more Anglo-Saxon your model, the smaller the impact! The policy instruments of Structural Funds (mainly physical infrastructure and human capital) provide inputs into a cohesion process, but do not guarantee it. Only if individual businesses vigorously exploit the improved economic environment through their business strategies is macroeconomic cohesion likely to occur, and models tend to be silent on these issues (Vernon, 1966; Porter, 1990; Best, 2001; Bradley, 2003).
How can these different approaches be combined to produce better cohesion policy advice? First, the Commission’s Cohesion Reports should be backed up by more analytical research, taken from the “testing” and “impact evaluation” strands of the literature. Second, the exclusive use of econometric and macroeconomic frameworks and models for SF impact analysis may condemn analysts to a methodology – no matter how theoretically elegant - that seems incapable of incorporating all relevant aspects of economic and industrial development into what are highly stylised models of behaviour. Third, there is a need to broaden the analysis to embrace research on industrial strategy. For example, when Midelfart-Knarvik and Overman praise Ireland’s clever use of EU structural funds (op.cit., page 349), it begs the question whether they would have equally approved the policy decisions made in the late 1950s and early 1960s where Ireland attempted to break out of the straight-jacket of an inherited comparative advantage in low wage, labour intensive manufacturing!

Perhaps we can never really know ex-ante how complex public investment programmes in infrastructure and human capital will affect economic growth and development, expressed in terms of a rigorously quantified, model-based, marginal impact. Within the European Commission, Structural Funds appear to be implemented and evaluated in relative isolation from other aspects of economic development (e.g., the so-called Lisbon Agenda, EMU, enlargement, increasing globalisation, etc.), even though the NDP policies (funded through Structural Funds) provide crucial, and as yet misunderstood, underpinnings to convergence. The Sapir Report was perhaps intended to address these wider challenges, but it has yet to produce any significant movement towards a greater integration of EU policy-making in the area of National Development Planning and cohesion (Sapir, 2003).
References


Commission of the European Communities (1990). One Market, One Money, European Economy, October.


