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The Macroeconomic Effect of EU Structural Transfers on the Cohesion Countries and Lessons for the CEECs

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Abstract

This paper provides an evaluation of the possible macroeconomic effects of EU financial assistance, such as the Pre-Accession Structural Funds, on the economic development of the CEECs. The experience of the Cohesion countries (Portugal, Ireland, Greece and Spain) with the Community Support Frameworks (CSF) is presented and discussed. The empirical assessment suggests that the Pre-Accession Structural Funds, which are similar in structure and rationale with the CSFs, can have an important bearing on the development of the transition countries. The analysis shows that the advantage that the CEECs can take of the Pre-Accession Structural Programs to promote development and the catch-up process is neither automatic nor predetermined. It depends on the specific micro-macroeconomic policies that the CEECs follow during the application of the programs. It also depends on how efficiently these programs are implemented.

Foreword

by János Gács

This paper is one of the results of a broad, multi-year research project of the Economic Transition and Integration Project of IIASA entitled “Catching Up and EU Accession – Prospects for First and Second Wave Countries”. The research was particularly encouraged by IIASA’s Swedish and Hungarian national member organizations, while financial support was provided by the (then) Swedish national member organization, the Swedish Council for Planning and Coordination of Research (FRN). Preparations for the project started in 1999. In addition to other forms of communication two workshops, one in Budapest in January 2000, and one in Stockholm in May 2001, helped to elaborate the research agenda, coordinate collaborative work and discuss results. Publication of the studies prepared in the framework of this projects started in September 2001.

The main ideas of the research project can be summarized as follows.

The accession of the Central and East European countries (CEECs) to the EU is likely to lead to conflicts between these countries and the incumbent members unless there is a rapid narrowing of the gap in per capita incomes between them. The CEECs are much poorer and have proportionately much larger agricultural sectors than the average EU country, and their combined populations make up between one-fourth and one-third of that of the current EU. Due to these characteristics there is concern in EU member states about a mass migration from the East following accession, about social and environmental “dumping” from CEECs, and about an increased demand by the CEECs on the EU’s Structural and Cohesion Funds, as well as on the funds provided under the Common Agricultural Policy.

These concerns, however, are counterbalanced to a large degree by a “catching up” predicted by both theory and experience: poorer countries, unless their development is impeded by institutional barriers, usually develop faster than richer ones, and there is a tendency toward convergence in levels of GDP per capita. In recent years, this catching up process seems to have started. In addition, trends in capital inflows and stock market developments suggest that the expected return on capital in the region is sufficiently high to support the buildup of stronger production capacities.

The research project on catching up studied the pattern according to which preparations for membership can trigger changes that will affect the growth process before and after membership. Special attention was paid to CEECs in different positions: those that started negotiations in 1998 and may reach membership first, and those that started negotiations in 2000. The effects on the sources of growth in both the pre-accession and post-accession periods were studied.

The following specific topics were investigated by the contributors of the project: the relevance of the export led East Asian development experience for CEECs; the forces of convergence and divergence that worked in the less developed EU member states (Spain, Portugal, Ireland and Greece) following their accession; the mixed experience of East Germany in catching up in a growth theoretic perspective; the role of domestic savings and savings behavior in the catch-up process; the likely pattern of the so-called Balassa-Samuelson process (real appreciation associated with the expected rapid productivity growth) in the course of the convergence; evaluation of the possible effects of EU structural aid on the candidate countries' development based on the experience of the cohesion countries of the EU; financial convergence of the candidate countries to the EU and the growth process; the role of institutions in the process of transition and catching up; and the relationship between the growth process and human development (health, education, standard of living, including inequality) in the context of EU accession.

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The Macroeconomic Effect of EU Structural Transfers on the Cohesion Countries and Lessons for the CEECs

Sarantis E.G. Lolos

1. Introduction

The contribution of the Structural Funds through the Community Support Framework (the CSF) to less developed regions is substantial. On the one hand, the CSF aims at transferring income to backward regions and thus increasing the average welfare of the people. On the other hand, it aims at promoting growth in these regions. Furthermore, the CSF programmes are strictly targeted, aiming at financing specific infrastructure investment projects and manpower training programmes. The accumulation of public capital, of human capital and also of knowledge deriving from the programmes strengthens the development process. Thus, the CSF activates an important mechanism of endogenous accumulation, necessary for the economic development of the European periphery.

The purpose of this study is to provide an evaluation of the possible macroeconomic effects of EU financial assistance, such as the Pre-Accession Structural Funds, on the economic development of the CEECs. Naturally, the fact that our approach focuses on the macroeconomic aspects of the EU structural funds does not mean that other aspects are less important. However, a wider treatment of these issues cannot be considered within the limited space of this paper and is, therefore, left out of the discussion.

This discussion is based on the experience of the, so-called, cohesion countries (Portugal, Ireland, Greece and Spain) with the CSFs. It is also based on the similarity of the CSFs to the cohesion countries with the pre-accession funds to the transition countries.

The structure of the paper is as follows. In Section 2, the rationale and size of the EU structural interventions is briefly presented as well as their role in promoting economic growth and structural change. In Section 3, the channels through which the EU funds affect the economy are discussed, while in Section 4 the evaluation approaches are presented. Section 5 reviews the models used for the macroeconomic evaluation of the CSF effects on the economy and the their results are presented and summarized. In Section 6, the EU pre-accession funding is presented, together with its likely macroeconomic effect on the CEECs. Finally, Section 7 concludes the issue.

2. Aim and size of EU structural interventions

The traditional Solow-Swan growth models explain economic growth through exogenous technical progress, the sources of which are not explained. The economies of the various countries are expected to converge since the factors of production exhibit diminishing returns and all countries have similar rates of technical progress. Also, countries are expected to converge to their long-run steady state growth rate, while policy interventions only affect the transition path. However, the empirical evidence shows that poorer countries are not catching up with the richer ones, owing to the absence of diminishing returns of factors of production. Nevertheless, countries do converge to their own steady states but at an uncertain rate and the factors affecting economic growth are still unclear and the issue of convergence is unresolved.¹

Recent advances of endogenous growth theory have put emphasis on the role of externalities and spillovers which come about through investment in physical infrastructure and human capital, and benefit the productive capacity of the economy.² There now exists a bulk of empirical research, also covering the lagging behind Southern European countries, which shows that the improvement of physical infrastructure and the upgrading of human capital have a positive impact on economic growth. It should be added, however, that these empirical issues are at the center of research interest, and there is substantial criticism on how the impact of infrastructure and human capital investment is quantified in these studies.³

Towards the end of 1980s, the European Communities carried out a substantial reform of the Community Budget taking specific actions in order to accelerate economic development in the regions lagging behind. These actions aimed at strengthening the factors that are thought to be playing a decisive role in promoting growth and competitiveness and help to reduce economic disparities within the European territory. The factors responsible for the achievement of economic and social cohesion were to be strengthened i.e. physical infrastructure, human capital and the capacity to innovate, although a direct relation between these factors and growth was not fully established. Since the end of 1980s, supporting economic and social cohesion remained the key objective of the EU. The instrument to fulfill this objective has been the European Structural Funds aiming at both promoting growth in and transferring income to the backward regions.

The result of this fiscal reform was a series of measures integrated in a comprehensive framework, the Community Support Framework (CSF) which was the main instrument for the Community's regional and structural policies. The Community's principal instruments for fulfilling this commitment are its Structural Funds, namely the European Regional Development Fund (ERDF), the European Social Funds (ESF), the European Agricultural Guidance and Guarantee Fund (EAGGF,

¹ There is a great number of empirical studies using cross-section data which come to the conclusion that convergence among various economies is possible, but there is also a great number of studies using time series data which come to the opposite conclusion. The discussion of the growth evidence is beyond the scope of this work. For a recent survey on these issues see Temple (1998).

² See the pioneering works of Lucas (1988), Romer (1986) and Aschauer (1989).

³ See Bradley *et al.* (2000) for a presentation of recent empirical studies on endogenous growth models for the cohesion countries and their relation to the Structural Funds interventions.

commonly known as FEOGA), and since 1993 the Cohesion Fund. However, the first attempt to support the less developed European regions was the Integrated Mediterranean Programmes of the second half of the 1980s which were directed to the South-European countries.⁴

The main objectives of the Community Support Framework (according to their so-called “objectives”) include:

- Objective 1: Promotion of the development and structural adjustment of regions whose development is lagging behind.
- Objective 2: Support of regions seriously affected by industrial decline.
- Objective 3: Combating of long-term unemployment.
- Objective 4: Facilitation of the vocational integration of young people.
- Objective 5a: Adjustment of agricultural structures.
- Objective 5b: Promoting rural development in the context of prospective CAP reform.
- Objective 6: Development of sparsely populated areas.⁵

In 1989, the first CSF was approved by the European Commission to cover the period 1989-1993, since the widening of regional disparities could threaten the successful realization of the Single Market. The programme provided 37.3 billion ECUs (at 1989 prices) allocated to seven countries. As Beutel (1998) rightly notes, the aid package in favor of the least developed regions has sometimes been compared to the European Recovery Programme. In the period from April 1948 to June 1952 Western Europe received 12 billion dollars of aid, a sum that was equivalent to 2.1 percent of the average of the receiver nations' GDP. Indeed Community grants made available for the five year period from 1989 to 1993 and the six year period 1994-99 represent a similar magnitude in terms of GDP.

In 1992, the second CSF was decided. The Commission's intention was to provide assistance to regions whose development was lagging behind, in view of the third stage of EMU. The second CSF for the period 1994-99 had a total volume of 208.7 billion ECUs (at 1994 prices). It was allocated to Spain, Greece, Ireland, Italy, Portugal, UK-N. Ireland and Germany. In terms of GDP, the CSF 1994-99 amounted to about 2 per cent of the receiver countries' GDP on average (over 3 per cent of GDP for Greece and Portugal).

Finally, in 1997, a new round of EU structural interventions, the CSF for the period 2000-2006, was decided by the European Commission arising from the document *Agenda 2000*. The current CSF covers the years from 2000 to 2006 and aims at promoting cohesion during the first period of the operation of the EMU. The EU funds amount to about 1.6 per cent of the cohesion countries' GDP on average (about 3 per cent of GDP for Greece and Portugal). Also, in *Agenda 2000* there is provision for pre-accession EU financing to the candidate Central and Eastern European Countries. See Section 6, below.

⁴ The European Commission also promotes actions of special interest for the support of economic and social fiber, the Community Initiatives, like ENVIREG, INTERREG, STRIDE, LEADER, etc.

⁵ Applying only to CSF 2000-06.

Note that Objective 1, that is, the promotion of development and structural adjustment of regions whose development is lagging behind, is the most important of these objectives in terms of the amount of financial assistance given to the eligible regions. Objective 1 covers the whole of Greece, Portugal, Ireland, and many regions of Spain. These are the less developed countries of the EU and they are frequently referred as “countries of Objective 1”.

Table 1 presents the size of the structural intervention through the CSF and the sources of finance (EU and national) over the ten year period 1989-99 for the cohesion countries (Objective 1).

The CSF includes Operational Programmes which are set in a comprehensive framework. The Operational Programmes have either a national coverage (e.g. Operational Programme for Industry) or a regional coverage (e.g. in Greece there are 13 Regional Operational Programmes) and in terms of allocated funds they are almost equally important as the national programmes.⁶ The Operational Programmes are financed by EU transfers from the Structural Funds, as well as by national sources of the beneficiary country at about equal proportions; a contribution is also provided by the private sector.⁷

Table 1: Structural Intervention and GDP ^(a)					
	Greece	Portugal	Ireland	Spain	Four countries, total
1989-93					
Total expenditure	17549	21673	11449	30279	80950
Community interventions	10401	10813	5071	14733	41017
National interventions	7148	10860	6378	15546	39933
Total expenditure (% of GDP)	4.4	6.0	5.8	1.5	2.8
Community interventions (% of GDP)	2.6	3.0	2.5	0.7	1.4
National interventions (% of GDP) ^(b)	1.8	3.0	3.3	0.8	1.4
1994-99					
Total expenditure	34760	31795	13077	82222	161854
Community interventions	17736	17642	7403	42400	85181
National interventions	17025	14153	5674	39822	76673
Total expenditure (% of GDP)	6.9	6.6	4.2	3.1	4.1
Community interventions (% of GDP)	3.5	3.7	2.4	1.6	2.2
National interventions (% of GDP) ^(b)	3.4	3.0	1.8	1.5	1.9

Source: European Commission; (a) absolute data in million 1994 ECU, (b) including contribution of private sector.

⁶ For example, the regional programmes of the Greek CSFs absorb about 40 per cent of total funds.

⁷ Note that the relative financial contributions should be in line with the so called “additionality condition”, according to which public expenditure of the beneficiary country should be maintained at the programmed level, independently of the CSF. The CSF programmes come on top of existing expenditures and there is no substitution.

Table 2 shows the percentage share of EU structural intervention in GDP and fixed capital formation of Objective 1 countries, over the period 1989-2006. Note the substantial contribution of EU funds to total investment, especially in Greece and Portugal, without which economic growth would have been less in the cohesion countries.

	Greece	Portugal	Ireland	Spain	Four countries total
Share in GDP, %					
1989-93	2.6	3.0	2.5	0.7	1.4
1994-99 ^(b)	3.0	3.3	1.9	1.5	2.0
2000-06	2.8	2.9	0.6	1.3	1.6
Share in Fixed Capital Formation, %					
1989-93	11.8	12.4	15.0	2.9	5.5
1994-99	14.6	14.2	9.6	6.7	8.9
2000-06	12.3	11.4	2.6	5.5	6.9

Source: CEC (2001, p. 122); estimates based on Eurostat data and projections for 2000-06.

(a) Including Structural and Cohesion Funds; commitment up to 1999; forecasts for 2000-06.

(b) Revised figures (compared to those of Table 1, above).

The EU financing by type and by area of intervention through the Structural Funds is shown in Tables 3 and 4, below.

The development priorities of the programme include the creation of economic infrastructure, the support of productive investment and directly related infrastructure. They also include the development of human resources, agricultural and rural development. Finally, the CSF aims at developing the regions' growth potential, local development and technical assistance.

	1989-1993	1994-1999	2000-2006
Infrastructure	35.2	29.8	34.3
Human resources	29.6	24.5	23.9
Productive environment	33.6	41.0	34.8
Other	1.6	4.7	7.0

Source: CEC (2001, p. 126)

Around 30-35 per cent of expenditure is spent on investment in new physical infrastructure (construction, machinery and equipment). The increase in 2000-06 is due to increased needs from the cohesion countries (mainly transport networks). Note that if the Cohesion Fund is included, infrastructure investment represents more than 40 per cent of total investment allocated to the Objective 1 regions.

A substantial part (about 25 per cent) is allocated to salaries, allowances and transfer payments to improve human resources. The gradual decline of human resources investment is compensated by the higher priority given to active labor market policies.

Finally, a proportion of over 35 per cent of total expenditure supports productive environment (investment), including direct aid to industry. It also includes the improvement of access to peripheral regions, and developing research activities for the enhancement of the “information society” which without EU support would not be carried out, due to national fiscal constraints.

Table 4: Resources of Cohesion Fund by area of intervention, 1993-99			
	Transport % of total	Environment % of total	Total EUR Mn
Greece	51.2	48.8	2998
Spain	49.7	50.3	9251
Ireland	50.0	50.0	1495
Portugal	48.1	51.9	3005
Total	49.7	50.3	16761

Source: CEC (2001, p. 127)

The resources of the Cohesion Fund, allocated to countries with GDP per head below 90 per cent of EU average, are distributed between transport and environment at about equal proportions. Within transport there is increased importance towards investment in railways, while in environment increased importance is given to waste water facilities in order to meet obligations imposed by EU directives.

3. The effect of Structural Funds on the economy

3.1. The transmission mechanism

The principal channels through which the CSF affects the economy are usually considered to be the following:

The EU Transfer

Initially, there is the EU capital inflow of the CSF, which is identified as an autonomous capital flow. This amount is directly reflected in the balance of transfers of the current account.

Demand Side Effects

The demand effects manifest themselves through the usual multiplier process and they are of a short-term nature. The demand effects stop with the termination of the Programme. The demand effects are of three kinds:

- The *first* includes financial assistance to public investment (infrastructure investment), including investment to public enterprises. These funds are registered in the Public Investment Programme and are the most important component of the CSF.

- The *second* channel is related to financial assistance for the improvement of human resources and skills. These programmes concern education and training for the upgrading of the labor force and the improvement of the efficiency of enterprises. Their direct short-run effect is to a great extent reflected in the creation of personal incomes through transfers to households. It is also reflected in the improvement of the profitability of enterprises through a direct effect on profits.
- The *third* transmission channel refers to various forms of financial assistance to enterprises for restructuring and the improvement of competitiveness.

Supply Side Effects

Apart from the demand side effects, the various components of financial assistance through the CSF have also important implications on the supply side of the economy. These supply side effects stem from an improvement in the productive capacity of the economy and they manifest themselves during the implementation and especially after the termination of the programme. They are of a long-run nature and they are induced by improvements in productivity of various sectors through investment in physical and human capital.

For example, the expenditure for the construction of a new road will boost incomes and employment (demand effect). At the same time the construction of the road will increase the productivity of the transport sector. This will result to a decrease in the transport cost which will benefit the other sectors of the economy (supply-side effect).

3.2. Assumptions and accompanying policies

According to the rationale of the CSF, that is the boost of demand and also the improvement of the supply side of the economy, the CSF effects on the economy are conditional to certain plausible assumptions, regarding the implementation of the Programme:⁸

- The programmed CSF related expenditures are *fully absorbed*, which affects mostly the demand side effects.
- The programme is *efficiently implemented* by the authorities, which mostly affects the supply effects.

It is obvious that any departure from these assumptions (partial absorption, inefficient implementation, etc.) will reduce the total impact of the CSF and will curtail the beneficial influences on the economy.

These emphasize the importance of the capacity of the recipient regions to take full advantage of the allocated EU funding. The inability to absorb the funds may arise from incomplete planning, overoptimistic setting of targets or insufficient feasibility-implementation studies. It may be also due to the existing inadequate institutional framework, to management weaknesses or to public resistance in the implementation of certain projects. Also, it may arise from unfulfilled co-financing requirements stemming either from fiscal problems in the case of national budget or from difficulties in

⁸ For a more detailed discussion see Hervé (1999)

mobilizing private funds. The beneficial impact on the economy will be curtailed also if the additionality condition is not observed or in case the implementation of the programmes creates conditions of the “Dutch disease” through which factor prices become distorted.

Furthermore, the CSF effects depend on the actual state of the economy, i.e. of the micro-macro economic regimes under which the economy operates during the programmes’ application period.⁹ This is so since the CSF application creates leakages, in terms of output and employment, which depend on the conditions prevailing in the economy. These leakages come either from the demand or from the supply side. The magnitude and the origin of these leakages is related to the micro-macro economic regimes under which the economy operates.

The issue of the leakages in the CSF implementation is clarified by considering two extreme situations of the functioning of the economy.

- The first polar case characterizes an economy which is constantly at full capacity due to a full flexibility of prices, wages, interest rates, and possibly exchange rates. In such a case, demand effects are necessarily nil at the aggregate level. Any additional demand will crowd out existing demand leaving total output unchanged, except for some reallocation of factors across sectors.

In this case there is a possibility that the rate of growth, that is the current allocation of output between investment and consumption, will be affected by the additional demand. However, this effect is likely to be rather small, because additional investment undertaken under the CSF is likely to crowd out private investment in such a full-employment framework. The only positive effect left is the direct productivity effect which may be associated with the CSF.

- On the other extreme we may assume that the economy is of the fix-price type and exhibits excess capacities in all sectors and unemployment in all labor markets. In such a case, the supply effects are nil and we have pure demand and multiplier effects which, however, are possibly reduced by the various usual leakages (e.g. imports, monetary tensions in case the CSF is not accompanied by an expansionary monetary policy).

The above schematic presentation of the two polar cases demonstrates that some leakages stemming from the demand and the supply sides of the programme are unavoidable, since reality lies between the two extremes. It thus follows that a reduction of these leakages should be also an objective for the efficient implementation of the CSF.

This can be achieved by the adoption of a suitable set of policy measures (accompanying policies), aiming at promoting the structural reform of the economy at both the micro and the macro level. In fact, there should be an internal consistency of both macroeconomic and microeconomic policies in the recipient countries. These policies should be an integral part of the CSF implementation.

They include microeconomic measures related to structural adjustment, labor market policies, competition policies, market liberalization etc. At the macro level the

⁹ For a detailed elaboration see Lolos *et al.* (1995).

accompanying policies should be directed towards the reduction of macroeconomic imbalances in order to promote macroeconomic stability. They should be also directed towards macroeconomic restructuring in favor of investment in order to boost the productivity of the economy and eventually to promote economic growth.

4. Evaluation approaches

As discussed above, the CSF is an integrated structural programme aiming at transferring income to lagging behind regions and also at enhancing the productivity of the economy in the European “periphery”. As a consequence, it should not be evaluated only with respect to its direct impact on the economy, but also with respect to its medium-term effects on the improvement of competitiveness and the effective utilization of the productive capacity.

In assessing an investment project, two types of evaluation come to mind: on the one hand traditional cost-benefit analysis, or, on the other hand macro-analysis, in the case of a sizable project or an extended programme including a number of projects.

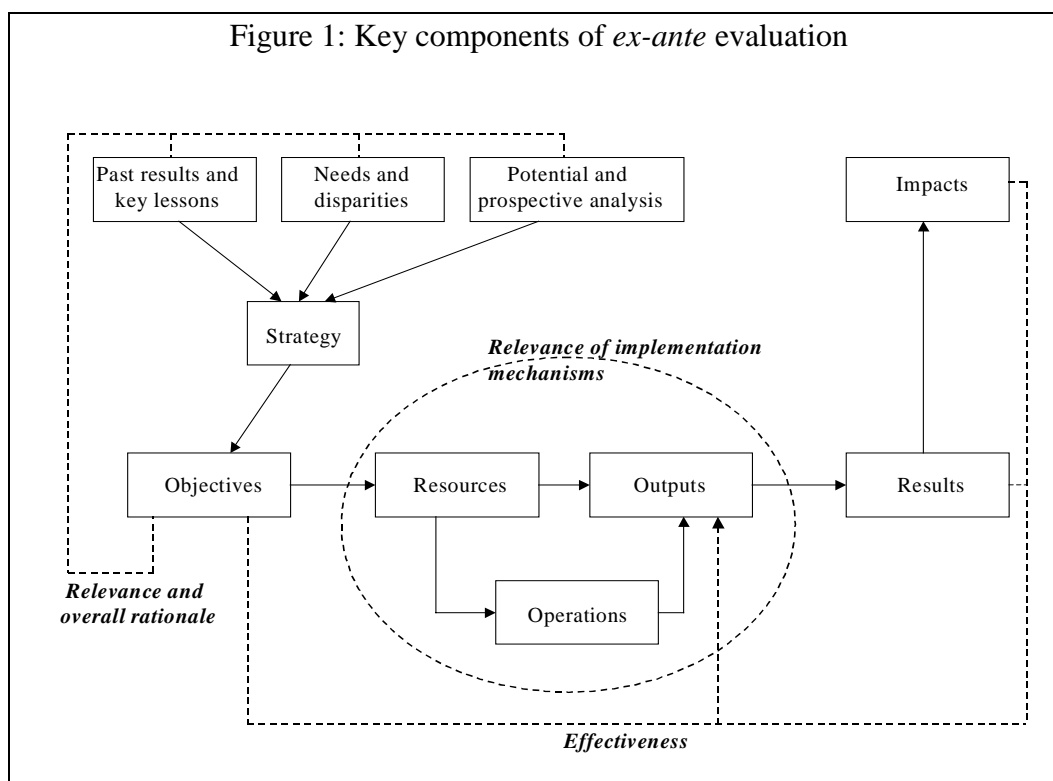
The evaluation of the macroeconomic effects of the CSF on the economy has been approached using economy-wide empirical models. The evaluations are distinguished between *ex-ante*, *on-going* and *ex-post* evaluations, all being an integral part of planning.

In the context of structural policies, the *ex-ante* evaluation process has a number of objectives (see also Figure 1, below):

- An assessment of whether the overall Programme is an appropriate means for addressing the issues confronting the region or sector.
- An assessment of whether the Programme has well defined strategic axes, priorities and objectives and if it reflects an informed opinion as to whether these are relevant and can actually be achieved.
- A contribution to the quantification of the objectives and the establishment of a basis for both monitoring and future evaluation.
- Should analyze the adequacy of the implementation and monitoring arrangements and help with the design of project selection procedures and criteria.
- The Commission aims to carry out a thorough analysis, notably at the level of the plan before the termination of the CSF.

According to the European Commission, “for the *ex-ante* evaluation of the macroeconomic impact of major Objective 1 Plans (cohesion countries, Southern Italy and Eastern Germany), *only* macroeconomic modeling can simulate the complex interdependencies between economic variables at the macroeconomic level. The model should feature both a demand side and a supply side. Improvement of the supply side is the main objective of Structural Funds interventions” (CEC, 1999, Annex II).¹⁰

¹⁰ See also *MEANS* (1999), for a detailed original discussion of current methodological practices.



Source: CEC (1999, p.6). Key components of *ex-ante* evaluation as defined at articles 40 and 41 of the Regulation.

As a rule, the supply side of the model should include the principal determinants of the productive potential of an economy in a way that reflects the ways in which Structural Funds interventions in areas such as infrastructure, human capital and productive investment influence productive potential. Furthermore, the actual use of productive potential in terms of output and prices is to be defined. As for the demand side of the model, the behavioral equations for private consumption, private investment, and government expenditure as well exports and imports need to be specified.

In view of the importance of estimates of employment effects, the model should also include a labor market, featuring labor demand and labor supply or, alternatively, a wage equation. The relation between wages and employment as well as the determination of the labor force by migration and participation should be defined explicitly.

The government sector should distinguish investment, purchases of goods and services and employment (possibly with a sub-category on education and training), as well as identify the national and EU co-financing of broad Structural Funds categories. By varying the assumed additionality of public expenditure, it should be capable of modeling a situation of EU funding alone as well as of EU funding and national funding together, both excluding private co-financing. In addition, the model should contain a government budget constraint and a specification of transfers to and from the EU so that

the opportunity costs of public spending can be taken into account (i.e. the effects of alternative uses of EU and national funds).

Finally, according to the European Commission, the sensitivity of results to changes in Structural Funds spending and in economic policy should be demonstrated. As regards the monetary policy regime, interest and exchange rates can be exogenous and allow for running simulations with fixed nominal interest and exchange rates.

In brief, the (*ex-ante*) evaluation procedure is as follows:

- First, a restatement of the CSF programmes and actions is needed in terms of the model variables.¹¹ This is necessary since the classification of the CSF expenditures, as presented in the Programme, is useful in an operational sense but it is inadequate for quantitative economic analysis and evaluation.
- Then, the model has to be estimated using observations about the economy under examination.
- The next step is to establish a run of the model (the “base-run”) for a period covering the implementation period of the CSF. In *ex-ante* evaluations a model projection is needed where a full implementation of the CSF is assumed. This model simulation is the “base-run” or the “full-CSF” scenario.
- We can then establish a second simulation of the model having excluded part or the whole of the CSF from certain variables of the model associated with the CSF implementation.
- Comparing these two scenarios we get an indication of the expected effect of the CSF on the economy (e.g. effect on GDP, effect on employment, prices, investment, etc.).

Thus, the CSF effect is quantitatively identified as *deviations between alternative simulation scenarios*. These scenarios are arrived at by modifying the magnitude of the exogenous variables of the models related to the CSF implementation.

Note that, using alternative simulation scenarios, it is possible to quantify separately the demand and the supply effects of the CSF, as well as specific components of the CSF (e.g. public investment or training programmes). It should be noted, however, that the precise quantification of the supply side factors is an extremely difficult issue.¹²

The possibility of carrying out this analysis depends on the model in hand.¹³ Thus, in some models it involves some parallel micro-economic analysis aimed at determining the impact of the CSF projects upon the productivity of the economy. In other models the supply side effects are endogenized. Finally, in other models of pure Keynesian inspiration where the emphasis is put on the demand side and supply side phenomena are partially treated, only one alternative scenario can be obtained, the non-CSF scenario, which is derived simply by eliminating all CSF inflows.

¹¹ For a detailed presentation see Lolos and Zonzilos (1992).

¹² For a comprehensive discussion of this see Bradley *et al.* (1991).

¹³ See also the next section with reference to particular models that have been used for the CSF evaluation.

5. Empirical results of the CSF effect on the cohesion countries

In this section the empirical results of the Structural Funds' effect on the cohesion economies are presented and discussed. This effect is evaluated with the help of various empirical models. The results of these models mainly refer to the quantification of the effect of the Community Support Frameworks of the periods 1989-93 and 1994-99 on economic variables, such as GDP growth, employment, prices, investment, etc.

In fact, the great majority of the models that are used usually evaluate the effect of the Objective 1 part of the CSF on the cohesion countries. Note also that although an overwhelming part of the programs and financial assistance through the CSFs is regional (around 40 per cent in terms of allocated funds), the aggregate character of the models does not distinguish between regional and national effects. Thus the models capture the overall effect of the CSF actions on the economy, after the diffusion of the regional actions.

5.1. The macroeconomic models used

In the case of the lagging behind European regions, a great variety of empirical models of various philosophies were used for the quantitative evaluation of the CSF effect, in fact for the *ex-ante* evaluation of the CSF, on the economy. Some examples are given below:

Econometric Models

- The *HERMES*¹⁴ model for the evaluation of the CSF 1989-93 (Ireland¹⁵).

The model is an econometric disaggregated model comprising of six sectors. It also allows to analyze the feedback mechanisms and dynamic properties (monetary and real) of the economy over the long run. The *HERMES*-Ireland model is made of about 650 equations and 850 variables.

- The *HERMIN*¹⁶ model for the evaluation of the CSF 1989-93 (Ireland¹⁷) and the CSF 1994-99 (Portugal,¹⁸ Spain¹⁹ and Ireland²⁰).

The model is an extension of the previous one to allow for the treatment of both demand and the supply-side shocks induced by the implementation of the CSF. To enable the latter to be integrated into the analysis seven microeconomic studies were

¹⁴ The model was developed by DG for Science Research and Development to study the medium to long term development of the Community countries on the basis of microeconomic analysis. See *HERMES* (1993).

¹⁵ See *CEC* (1991).

¹⁶ The model was initially developed at the Economic and Social Research Institute, Dublin. See, for instance, Bradley and Whelan (1990), Bradley *et al.* (1991).

¹⁷ See *CEC* (1991).

¹⁸ See Bradley *et al.* (1994, 1995).

¹⁹ See Herce and Sosvilla-Rivero (1994); also Bradley *et al.* (1995).

²⁰ See Bradley *et al.* (1994, 1995).

carried out (industrial competitiveness, transport costs, industrial market structure, labor market, agriculture and food industry, services, industrial sector).

The results point to the important contribution of the CSF on the development of EU's periphery countries. They differ from one to another country, depending on the particular characteristics of each country. The overall positive effects are more pronounced in Portugal and less so in Spain and Ireland. Spain and Ireland have much larger supply effects than Portugal.

- The *QUEST II*²¹ model for the CSF (1989-93 and 1994-99), for Portugal, Spain, Ireland and Greece.²²

The model can be characterized as a modern version of the Neoclassical-Keynesian synthesis. The behavioral equations are based on microeconomic principles of intertemporal optimizing behavior of households and firms, and the supply side of the economy is modeled explicitly via a neoclassical production function. The steady state growth rate is essentially determined by the rate of (exogenous) technical progress and the growth rate of the population. Also the real rate of interest in the long run is determined by private savings behavior, especially the discount rate of private households. Similarly, the real exchange rate equilibrates the current account in the long run, i.e. it moves in such a way as to make the net foreign asset position of the country sustainable. In this type of model economic policy will not be able to change the long run growth rate, unless it is able to affect the rate of time preference, the rate of technical progress or the growth rate of the population. It can, however, affect the long run level of output and thereby the transitory growth rate of the economy over extended periods of time until the new (steady state) income level is reached.

The results showed that the CSFs may lead to an increase of the annual GDP growth rate by up to 0.3 per cent on average for Portugal, Greece, Ireland but less so in Spain. Also, after the termination of the programmes' implementation there remains for some time a positive supply-side effect. The CSF interventions may also lead to a reduction in the rate of unemployment by up to 0.2 to 0.3 per cent.

- A *Four-Sector Macroeconomic Model* for the evaluation of the CSF 1994-99 for Greece²³).

The model is based on the HERMIN model and consists of four sectors of economic activity (traded, non-traded goods, the public and the agricultural sectors). It includes a detailed system of price formation, wage setting and public finances. The dynamic properties and multiplier effects are thoroughly analyzed. CSF flows cause both a rise in total demand and in domestic supply through positive supply-side externalities. The evaluation distinguishes between a very low and a full degree of utilizing the plausible opportunities.

The conclusion is that in the absence of externalities, CSF actions produce only a temporary rise in economic activity and employment. After the period of inflows expires, the economy will return to the course that would have been without the funds.

²¹ The QUEST II model was developed by DG II of the European Commission. See Roeger and Veld (1997).

²² See Roeger (1998).

²³ See Christodoulakis and Kalyvitis (1998).

If all externalities are assumed to operate, even at moderate scale, then output, productivity, employment and the exporting capacity of Greece improve significantly²⁴.

- An econometric *Keynesian*²⁵ macro-model for the evaluation of the Greek CSF 1989-93.

The model is Keynesian in inspiration and essentially demand driven; it is highly dynamic using extensively error correction formulation and cointegration techniques in the specification of most behavioral equations. The formulation of the model is essentially determined by the objective of the study. The financial sector of the economy is not modeled, although financial flows affect economic activity through investment functions. Interest rates and the exchange rate as well as exports are treated exogenously. Despite its aggregate character, the model describes adequately the main macroeconomic linkages of the Greek economy and offers answers to important questions regarding the CSF impact. The model is estimated over the period 1960-88, using annual observations for the Greek economy.

The results show that the EU component of the Greek CSF is expected to increase the annual rate of growth by around 0.5 per cent, also creating around 50,000 new jobs. The effect on the inflation rate is marginal.

- The *Wharton-UAM* model for the evaluation of the Spanish CSF 1989-93²⁶.

The model is an econometric large-scale demand model, comprising of 558 equations and 743 variables. It is also a sectoral model with equations specifying value-added by sector. The model includes the monetary side of the economy. The empirical results are presented in Section 5.2, below.

Computable General Equilibrium (CGE) Models

- A *CGE*²⁷ model for the evaluation of the Greek CSF 1989-93 and 1994-99.²⁸

The model is an application to the Greek economy of the extended Computable General Equilibrium (CGE) model. It is a micro-macro simulation model, which combines a standard Computable General Equilibrium framework with full-fledged macroeconomic closures. Special emphasis is put on the financial sector, foreign exchange and capital movements. It is able to describe the likely short-run demand effects of the CSF on main economic variables, such as, effective demand, GDP, the balance of payments, the budget, employment, inflation etc. Furthermore, the model is well equipped to deal with the structural and supply side effects of the CSF. The model distinguishes between various sectors and markets. The CGE model was calibrated for the year 1988 for the evaluation of CSF 1989-93 and for the year 1993 for the evaluation of CSF 1994-99.

²⁴ For instance, the economy achieves an annual growth rate 0.4 per cent higher for 16 years after the termination of the CSF.

²⁵ The model was developed by Lolos and Zonzilos (1994). See also *CEC* (1991).

²⁶ See *CEC* (1991).

²⁷ The model was initially developed by the IMF and then by the OECD (the B-B-M model). See Bourguignon *et al.* (1989).

²⁸ See Lolos *et al.* (1995) for the CSF 1989-1993. Also Lolos and Theodoulides (2001) for the CSF 1994-1999.

The results of the *ex-ante* evaluation showed that at the end of the programme the level of GDP would be higher by about 3 per cent in relation to its corresponding level without the EU contribution. Over half of this increase is due to the demand side effects, while the impact of the supply side factors amounts to less than half of the total increase. With regard to employment, the results showed that the efficient implementation of the CSF would lead to a maximum number of around 100,000 new jobs. About half of these new jobs would be due to demand factors and have a temporary character. The rest will come about from factors affecting the supply side of the economy and are definitely of a permanent nature.

The model was also used for the *ex-post* evaluation of the CSF 1989-93. The results showed that the direct impact of the CSF on the Greek economy which is related to the demand side effect seems not to be inferior to the *ex-ante* estimates. As far as the creation of employment is concerned, there has been an actual increase in new jobs of 60,000, over the period 1989-1993, while the CSF played a decisive role in job creation, since it is estimated that it has been responsible for about 35,000 new jobs. On the contrary, serious differences were observed on the effect of the CSF on the supply side factors which are responsible for the improvement of competitiveness of the Greek economy. We return to the issue of *ex-post* evaluation.

- A *Dynamic CGE*²⁹ model for the evaluation of the Portuguese CSF 1989-93.

It is a long-run two-sector growth model that builds upon the recent endogenous growth literature. It evaluates the impact of structural policies on both demand and supply sides, by analyzing optimal accumulation of public and private capital and human capital. Human capital is assumed to reflect the level of knowledge available in the economy and is a source of endogenous growth. Public capital, which represents public infrastructures, is an externality to private production. The accumulation of public capital is responsive to economic incentives and is also a source of endogenous growth. In the determination of the optimal path for the economy, the evolution of both the public sector account and the current account plays a crucial role. The model consists of nine equations and, because of its complexity is not solved analytically but is parameterized and solved numerically.

The empirical results of the *ex-ante* evaluation showed that EU structural programmes induce an important and permanent improvement in the annual rate of growth of the order of 0.5 per cent. They also increase the share of private investment in GDP at a rate between 1.0 and 1.5 percentage point per year. Finally, they contribute markedly to the real convergence of the Portuguese economy to the EU standards.

Input-Output Models

- *Input-Output* models for the CSF (1989-93 and 1994-99), for the countries or regions of Objective 1 (Greece, Portugal, Ireland, Spain, Italy, UK-N. Ireland).³⁰

The model is a comparative statics input-output sectoral (highly disaggregated) system concentrating on the short-term CSF impacts. It has been developed for the Directorate-General for Regional Policies and Cohesion to evaluate the economic impacts of Structural Funds intervention with the main purpose to establish a

²⁹ See Pereira and Gaspar (1999). Also CEC (1991).

³⁰ See Beutel (1990, 1995).

harmonized data base and methodology for impact analysis. With a new set of harmonized input-output tables Eurostat is providing the appropriate data base for such analysis.

The results showed that the Community grants of the CSF 1989-93 could raise economic growth in Portugal by 3 per cent, in Ireland by 1.4 per cent, in Southern Spain by 1.0 per cent, in Southern Italy by 0.8 per cent and in Northern Ireland by 0.9 per cent, while in Greece by 2.8 per cent. However, using a very similar model for the evaluation of the CSF 1994-99, the respective figures seem to be on the low side (0.5, 0.5, 0.4, 0.2, 0.2, 0.5). The CSF has an important bearing on gross capital formation of the recipient regions, on the reduction of unemployment and on structural change.

- *Dynamic Input-Output* models for the CSF (1989-93 and 1994-99), for the countries or regions of Objective 1 (Greece, Portugal, Ireland, Spain, Italy, UK-N. Ireland, Germany-Eastern).³¹

In extension of the previous studies, a dynamic input-output model was developed which is capable to evaluate the long-term supply and demand effects of the Community structural policies. The dynamic input-output model is designed in line with the multiplier-accelerator analysis of macroeconomic theory. According to this theory it is expected that new capacities are required if final demand components are growing. Therefore, induced investment is estimated which can be related to the activities of the Structural Funds. In the first part of the model it is estimated how an increase of gross fixed capital formation will affect the economy which was financed by the Structural Funds to improve the infrastructure of public and private institutions. In the second part it is analyzed how the contributions of Community interventions affect value added. In the third part of the impact analysis system a dynamic version of the input-output model is used to evaluate the long-term supply effects of the Structural Funds.

The results indicate that the Structural Funds 1989-93 and 1994-99 contribute up to 1.0 per cent to the anticipated growth rate of GDP in Portugal, Greece, Ireland and Spain. Steady implementation of the CSF is of crucial importance for the potential growth of these economies and contributes to a faster growth of capital formation, also reducing unemployment

Models for Specific Regions³²

- A simplified demand model for the overseas departments of *France* and *Corsica*.

These are not econometric models and the monetary sector is not taken into account. The parameters are pre-set by experts using available data and information, into which the CSF data are injected. The formal structure of these models is very simplified, consisting of seven equations and 12 variables and their output is somewhat approximate. The empirical results are presented in Section 5.2, below.

- A General Equilibrium model for the two regions of *Italy* (Mezzogiorno and Centre-North).

It is a comparative static model with nine equations (matrix design) which are used to evaluate macroeconomic impacts on the demand side and sectoral effects. The

³¹ See Beutel (1998).

³² For a brief description of these models see *CEC* (1991).

model can also take into account some supply side effects. The monetary sector is missing. The empirical results are shown in Section 5.2, below.

5.2. Summary results of the CSF 1989-93

Estimates of the possible *ex-ante* effects of the CSF 1989-93 (Objective 1) on the EU economies are given in Table 5, below. The results arrived at using a variety of different philosophy models, which were presented and discussed above.

Table 5: Expected growth rate of GDP over 1989-93 (per cent)			
	Including the CSF	Excluding the CSF	CSF Effect
Portugal	4.1	3.4	0.7
Ireland	4.0	3.7	0.3
Spain (Obj. 1)	3.4	3.2	0.2
Italy (Obj. 1)	2.6	2.4	0.2
UK (Obj. 1)	2.3	2.1	0.2
Greece	1.7	1.2	0.5

Source: CEC (1991), p. 24.

All CSF regions except UK (Northern Ireland) and Greece are expected to grow above the EU average (2.7 per cent) for the five year period (1989-93). Also, the greatest contribution to anticipated average annual growth is assigned to Portugal and Greece, 0.7 and 0.5 per cent respectively, while the CSF effect on other regions is lower, although significant.

To illustrate the relative importance of the CSF, the effects on the economies are estimated on the assumption that, *ceteris paribus*, the transfers were abruptly interrupted in 1993. As shown in Table 6, most economies would suffer from a severe demand shock.

Table 6: Expected growth rate of GDP in 1993 (per cent)		
	Including the CSF	Excluding the CSF in 1993
Portugal	3.9	0.9
Ireland	3.5	2.0
Spain (Obj. 1)	3.4	2.4
Italy (Obj. 1)	2.6	1.8
UK (Obj. 1)	1.9	1.1
Greece	1.6	-0.5

Source: CEC (1991), p. 25.

A rough assessment of the relative influence of the CSF on the supply potential of the economies concerned is provided by the extent to which capital formation is induced, as shown in Table 7 (though the results account only for the demand effects of the CSF). The figures clearly illustrate the crucial importance of the CSF implementation for the potential growth of the economies, through its contribution to the increase in investment.

Table 7: Growth rate of Gross Fixed Capital Formation (GFCF) and the CSF		
	Expected growth rate of GFCF including the CSF (1989-93)	Percentage share of GFCF depending on the CSF (1993)
Portugal	7.9	23.2
Ireland	8.4	17.7
Spain (Obj. 1)	8.4	6.9
Italy (Obj. 1)	4.1	6.3
UK (Obj. 1)	3.2	12.5
Greece	5.0	25.3

Source: CEC (1991), p. 25.

5.3. Summary results of CSF 1994-99 (mid-term evaluation)

Mid-term evaluations seek to gauge the degree to which programme implementation matches up to the original goals and, where appropriate, to propose adjustments in line with the degree of effectiveness achieved. These evaluations have often played an active part during mid-term reviews and also a certain number of good practices have been highlighted with a view to the forthcoming programming period.³³

The empirical results at the macroeconomic level (Table 8) via model simulations carried out at CSF level show that Structural Fund support significantly affects the economic activity of the regions concerned.

In particular, the CSF impact will give rise to a significant GDP increase in 1999 (ranging from 2 per cent in Southern Italy to 5.1 per cent in Spain), as against what it would have been without the Structural Funds flows. Care should be given to the comparability of these empirical results due to the use of different models. The impact on jobs, albeit lower on account of the positive effects on productivity, is also significant, (ranging from 1.0% additional jobs in Italy to 3.7% in Portugal). The empirical evaluation of the CSF also showed that substantial progress has been made in developing basic infrastructure in the Objective 1 regions.

Table 8: Macroeconomic impact ^(*) of the CSF 1994-99 (in percentages)		
	Additional GDP	Additional Jobs
Portugal	4.4	3.7
Ireland	3.8	3.2
Spain (Obj. 1)	5.1	2.4
Italy (Obj. 1)	2.0	1.0
Germany (Obj. 1)	3.2	1.5
Greece	4.8	2.9

Source: CEC (1998). (*) Compared with the base scenario in 1999 (without CSFs).

³³ The results of these studies are presented in CEC (1998).

5.4. The second cohesion report

Recent empirical evaluations of the CSFs effect on the economy of the cohesion countries showed that over the ten year period 1989-1999 they have been responsible for a substantial boost in real growth, especially in Greece and Portugal and less -though significantly - in Spain and Ireland (CEC, 2001).³⁴ Also, increased growth resulted in lower unemployment, particularly in Greece and Portugal. Furthermore, the empirical results showed that the supply-side effects have been equally important to the demand-side effects and they become predominant in the longer term as the strengthening of productive potential boosts output.

As for the expected effect of the CSF 2000-2006 on the recipient countries, the empirical results showed that the structural policies can create an environment for faster economic growth without inducing inflationary pressures. Furthermore, EU interventions can increase employment and reduce structural unemployment (CEC, 2001, p. 148).³⁵

Apart from the beneficial CSF effect on GDP and unemployment, these empirical studies showed that the EU funds do not affect inflation adversely, thus not creating conditions for “Dutch disease” in the cohesion countries.³⁶

As for the achievement of convergence to the EU average, in terms of GDP per head, the EU funds definitely offer the opportunity for the cohesion countries to grow faster than the EU average. However, the governments of the recipient countries can take more (or less) advantage of this beneficial impact of the EU funding by implementing more (or less) successful policies. Furthermore, since the comparison of the GDPs is made at PPP, real convergence is also determined by price developments in each country, which is a domestic matter. Hence, the speed of catching-up greatly relies on the ability of each country to achieve good economic performance.

Apart from the assessment of the overall impact of the Structural Funds on the development of the lagging behind European regions, these studies go through a detailed evaluation in qualitative and quantitative terms of the particular programmes and actions.³⁷ For example, they assess the impact of actions supporting SMEs on regional competitiveness, the effect of the support of research and technological development and innovation on the strengthening of regional capacity, etc. This kind of assessment of the CSF actions is definitely very useful, but a detailed presentation and discussion is beyond the scope of this paper.

In what follows, we discuss the impact of the CSFs on GDP and employment of the four cohesion economies (Greece, Portugal, Ireland and Spain). The discussion is based on the results of the *ex-ante* CSF evaluation using the HERMIN model, adopted

³⁴ These are *ex-ante* evaluations but they take into account the actual path that the economies of the cohesion countries followed over the 1990s.

³⁵ The empirical results are reached via the *HERMIN* (Bradley, 2000) and the *QUEST II* (Roeger, 1996) models. The results of the *HERMIN* model are more optimistic compared to those of the *QUEST II* model, the differences arising from the structure of the two models.

³⁶ This result is also reached by the great majority of the studies discussed in Section 5, above.

³⁷ This is a “preliminary *ex-post*” exercise, since the final *ex-post* evaluation results will not be ready before the beginning of 2002.

by the report of the European Commission (CEC, 2001, p. 131). They are summarized in Tables 9 and 10, below.

Part (A) of Table 9 depicts the expected average annual impact of each one of the three CSFs on GDP. The figures refer to the end of period CSF impact on the level of GDP (as a percentage deviation from non-CSF estimate). The figures show the expected increase in GDP because of the CSF, compared to what it would have been in the absence of the EU intervention. This gives a measure of the expected “CSF induced increase in GDP” for each of the CSFs, in the four countries.

In addition, the figures in part (B) depict the “average annual size of the EU intervention”, which is given by the average annual percentage share of the CSF in GDP (taken from Table 2, above).

Finally, the figures in part (C) are the ratios of the expected “CSF induced increase in GDP” over the “size of the EU intervention”. This is a kind of an “approximate multiplier”, an index of the “beneficial impact” of CSF with respect to GDP. The usefulness of this measure is that it is approximately comparable across the four cohesion countries and also between the three CSFs.

Table 9: Expected effect of CSF on GDP ^(a)				
	Greece	Portugal	Ireland	Spain
(A) Increase in GDP due to CSF - ΔY ^(b)				
1989-93	4.1	7.4	3.2	1.5
1994-99	9.9	8.5	3.7	3.1
2000-06	7.3	7.8	2.8	3.4
(B) Percentage share of CSF in GDP (annual size of CSF) - ΔEU ^(c)				
1989-93	2.6	3.0	2.5	0.7
1994-99	3.0	3.3	1.9	1.5
2000-06	2.8	2.9	0.6	1.3
(C) “Beneficial impact” of CSF with respect to GDP, “multiplier” - $\Delta Y/\Delta EU$ ^(d)				
1989-93	1.6	2.5	1.3	2.1
1994-99	3.3	2.6	1.9	2.1
2000-06	2.6	2.7	4.7	2.6
Average 1989-2006 (approx.)	2.6	2.7	2.8	2.4

Notes: (a) the EU component of CSF; (b) end of period CSF impact on level of GDP, as a percentage deviation from non-CSF estimate (source: ESRI, estimates based on the HERMIN model, as quoted in CEC 2001, p.131); (c) source: Table 2, above; (d) ratio of (A)/(B).

In the light of the discussion carried out in Section 3 above, with respect to the transmission mechanism of the CSF and the factors affecting its functioning, we shall make comments on the results of Table 9 and offer explanations of the CSF impact on the cohesion economies. In particular:

- Over the *medium-term* (1989-2006), the four economies seem to exhibit essentially a very similar behavioral pattern in relation to the expected CSF impact, since their “CSF multipliers” (CSF induced effect on the economy per CSF unit of GDP) are of very similar magnitude. The results indicate that a GDP unit of EU funds is expected to increase the level of aggregate economic activity by 2.5 per cent, at the end of the

implementation of the programme.³⁸ This means that, on the average, a GDP unit of EU funds will increase GDP *annual* growth at a rate of the order of 0.5 per cent. Thus, in Greece and Portugal the CSFs with a magnitude of about 3 GDP units are expected to give an average annual boost to these economies by around 1.5 per cent, while the relatively smaller CSFs in Spain and Ireland are expected to induce an average annual growth of about 0.5 per cent.

The close similarity between the multipliers' values, though over the medium-term and on the average, is somewhat striking and needs explanation. I feel that, in general, macroeconomic models are capable of capturing fairly adequately the demand side developments of the economy, but they are not sufficiently equipped to capture the supply side effects. In the case of the CSF effect, the impact of the supply side factors on the economy is thought to be almost equally as important as the demand effects. However, the precise quantification of the supply side factors is extremely difficult, involving the determination of the impact of the CSF projects upon the productivity of the economy. In fact, the quantification of the supply side effects is to a great extent subjective stemming from a great number of assumptions and lying within a reasonable range. Because of these difficulties, in the case of the CSF, the modeler is tempted to quantify the supply side effects using his experience in such a way so that the results obtained are reasonable. This is understandable given the encountered theoretical difficulties and the slim empirical evidence.

Thus, the results should be viewed with caution and they should be regarded as a broad indication of the order of magnitude of the CSF effect on the economy. In this respect, I think they are useful. But they should not be taken at face value, since the model is not capable to produce accurate estimates.

- These results hold irrespective of the diversity in the four countries in terms of structure, level of development etc. For example, judging from Greece and Portugal, we see that although the two countries have very different sectoral structure (the share of the industrial value-added in GDP is about 30 per cent in Portugal, as against less than 15 per cent in Greece), the magnitude of the medium-term CSF effect on GDP is very much the same.

Again, an explanation of this result is needed, since sectoral structure does not seem to matter, contrary to the strong tradition among growth theorists pointing to the opposite direction. This model result may be due to specification deficiencies; alternatively, it could be attributed to the fact that the CSF impact of the various sectors is blurred by the “erroneous” differentiated estimates of the supply side effects of the various sectors. I feel that a more detailed sectoral structure of the model does not add much to the analysis, since the accurate quantification of the supply side effect for each sector, although based on precise scientific reasoning, is effectively arbitrary.

³⁸ The comparisons do *not* differ significantly if we adopt the results at the QUEST II model, although the absolute values of the expected effects do differ. That is, the values of the respective “multipliers” of the QUEST II model for the four countries are also very close, although their magnitude is lower due to a different model philosophy. In particular, the average value of the “CSF multiplier” is 0.52 (Greece: 0.50, Portugal: 0.40, Ireland: 0.43, Spain: 0.75). See Roeger (1998).

- However, the results indicate that, over the *shorter-term*, that is during the implementation period of each one of the CSFs, the behavior of the economy with respect to the CSF *varies* both across countries and between the CSFs. These differences could be explained by the relative success or failure of the micro-macro policies followed during the application of the structural programmes.³⁹ It seems to be the case that the quality of the CSF accompanying policies, referred to above, are very important and they crucially determine the extent of the beneficial CSF effect on the economy.⁴⁰

Table 10: Expected effect of CSF on Unemployment ^(a)				
	Greece	Portugal	Ireland	Spain
(A) Increase in Unemployment due to CSF - ΔU ^(b)				
1989-93	-2.9	-4.1	-1.0	-0.8
1994-99	-6.2	-4.0	-0.4	-1.6
2000-06	-3.2	-2.8	0.4	-1.7
(B) Percentage share of CSF in GDP (annual size of CSF) - ΔEU ^(c)				
1989-93	2.6	3.0	2.5	0.7
1994-99	3.0	3.3	1.9	1.5
2000-06	2.8	2.9	0.6	1.3
(C) "Beneficial effect" of CSF with respect to Unemployment, " <i>multiplier</i> " - $\Delta U/\Delta EU$ ^(d)				
1989-93	-1.1	-1.4	-0.4	-1.1
1994-99	-2.1	-1.2	-0.2	-1.1
2000-06	-1.1	-1.0	0.4	-1.3
Average 1989-2006 (approx.)	-1.6	-1.3	-0.3	-1.1

Notes: (a) the EU component of CSF; (b) end of period CSF impact on the unemployment rate, as a percentage deviation from non-CSF estimate (*source: ESRI, estimates based on the HERMIN model, as quoted in CEC 2001, p.131*); (c) *source: Table 2, above*; (d) ratio of (A)/(B).

The relation between the CSF impact and policy stance (and economic performance) is better understood if we examine the expected CSF performance in the various countries. For example, the relatively poor CSF-1 induced growth in Greece (0.4 per cent annually, per GDP unit of EU funds) can be explained by policy failures during the first half of the 1990s, while the outcome of the exceptionally successful policies over the second half of the 1990s are reflected in the unexpectedly high CSF-2 induced growth (0.7 per cent, a year).⁴¹ On the other hand, the successful economic policies in Portugal and Spain over the whole of the 1990s managed to achieve a smooth and fairly beneficial CSF-1 and CSF-2 induced economic expansion (0.5 per

³⁹ We reiterate that the estimates have taken into account the actual paths of the economy for CSF I and II.

⁴⁰ Apart from the results of this model, it has been proved empirically, using different models, that the kind of micro-macro policies applied during the CSF implementation affect the impact of the programme on the economy. See for example, Lolos *et al.* (1995) for the case of Greece.

⁴¹ The relation of policy actions to the CSF effects on the economy for the case of Greece is discussed extensively in Lolos and Theodoulides (2001).

cent annually, per GDP unit of EU funds).⁴² Also, the so-called, “Irish economic miracle” is reflected in the expected impressive beneficial impact of CSF-3 (0.8 per cent).

We may note that the variation of the CSF effect between the CSFs is captured by the model results, reflecting mainly the development of the aggregate economic variables and the demand components, as the model is well equipped to perform this analysis.

With regard to the CSF impact on unemployment reduction, we carried out similar calculations as for GDP and the results are presented in Table 10, above. In particular:

- Over the medium-term, the economies of the cohesion countries - except Ireland - essentially show a quite similar behavioral pattern with regard to the expected beneficial CSF impact on unemployment, since the magnitude of their relevant “approximate multipliers” is close to each other. In broad terms, a GDP unit of EU funds is expected to reduce the rate of unemployment by about 1.0-1.5 per cent, by the end of the implementation period.
- As in the case of GDP, the results indicate that the CSF induced effect on unemployment to a large extent depends on policy choice and economic performance. The beneficial CSF impact on unemployment is expected to be greater in Greece, especially for CSF-2, compared to Spain and Portugal. For Ireland, the CSF beneficial effect is diverted to GDP growth and the respective CSF impact on unemployment is rather small.

5.5. Ex-post CSF evaluation

The results presented above refer to the *ex-ante* evaluation of the CSF effect on the economy. However, the question is the extent to which this beneficial effect can actually be realized. The answer relates to the *ex-post* evaluation of the CSF. Methodologically, the *ex-post* evaluation to a great extent relies on the *ex-ante* evaluation, where an effort is made to assess whether the assumptions on which the *ex-ante* evaluation is based are valid. This, besides the macroeconomic analysis, involves a more detailed analysis of the CSF results at regional and sectoral level, which is complementary to the macro-analysis. The *ex-post* evaluation of the CSF 1994-99 has not yet been carried out since the programme has not, in fact, been terminated.

Below, we present the *ex-post* evaluation results of the Greek CSF 1989-93 to serve as an example of *ex-post* evaluations. We also make a judgment (an *ex-post* evaluation in qualitative terms) on the expected results of the Greek CSF 1994-99.

The *ex-post* evaluation of the Greek CSF 1989-93 has shown that the resources were fully absorbed but not in an efficient manner (Lolos, 1995).⁴³ In particular, the direct *ex-post* impact of the CSF, related to the demand effect was found not to be

⁴² For a comparative discussion of economic policies between Greece and Portugal see Lolos (1998).

⁴³ The *ex-post* evaluation is based on the *ex-ante* evaluation using the CGE model for the Greek economy, see above.

inferior to the respective *ex-ante* estimates. Thus, the Programme has given an estimated boost to the level of real GDP of about 2.5 percentage points while it has been responsible for the creation of only 45,000 new jobs.⁴⁴ On the contrary, serious deviations have been observed between the *ex-ante* and the *ex-post* estimates of the CSF effect on the supply side, greatly curtailing the activation of endogenous growth mechanisms. This, to a great extent, has resulted from the inefficient functioning of public administration and the inexperience of management of large-scale projects, the deficient operation of public and private training schools, the lack of correspondence of industrial policies with the respective operational CSF programmes, etc.⁴⁵

In addition, the application of the CSF 1989-93 was not supported by the adoption of suitable micro-macro policies aiming at promoting structural reform and reducing the leakages associated with the implementation of the programme. In fact, over the first half of the 1990s, there have been serious delays in the application of the necessary accompanying policy measures aiming at a more efficient operation of the markets (competition improvement, modernization of firms' institutional and funding framework, modernization of labor relations, etc.). Thus, the actual (*ex-post*) CSF 1989-93 impact on the economy was found to be lower than the initially expected (*ex-ante*) result.

However, the CSF 1994-99 can be considered more efficiently implemented than its 1989-93 counterpart, since not only the demand side multiplier effects were motivated but also there have been mobilized mechanisms introducing positive externalities in the production process. The more efficient CSF implementation is related to the experience gained in materializing extended structural programmes which gradually improved the quality of implementation procedures of large-scale projects (e.g. monitoring and production of public works). It is also related to the application of suitable micro-macro policies over the second half of the 1990s which facilitated structural reform and improved market functioning. These were the Convergence Programme that achieved macroeconomic restructuring in favor of investment and reduced uncertainty, as well as the various measures at microeconomic level aiming at improving flexibility and competition (e.g. liberalization of financial system).

Furthermore, the CSF implementation has induced much broader structural changes in the operation of the economy than were experienced earlier. The necessity to carry out the programme in time disclosed the inefficiency of the public sector and pressed for its substantial reform. Also, the private sector has gradually been taking over the management of various projects which in the past was considered to belong to the public sphere. In addition, the CSF is gradually being conceived by the decision makers and the public as a reform programme with a long-term perspective and not as a short-term EU financial assistance. It is also understood that the beneficial impact of the CSF

⁴⁴ The CSF was expected to raise real GDP by 3.7 percentage points and create about 100,000 new jobs.

⁴⁵ Note, for example, that the authorities, in view of the difficulty in absorbing the EC funds in large-scale construction projects, reallocated a quarter of these funds to the construction of a great number of small-scale projects of regional range, very useful in local development but unable to trigger endogenous growth mechanisms. Also, the majority of funds for the improvement of human capital (e.g. training), were fully absorbed though without adequate monitoring.

is neither automatic nor predetermined but it critically depends on the behavior of economic agents (public and private). These changes become particularly significant since they are expected to boost economic dynamism and enable the economy to achieve above EU average growth rates, i.e. to close the development gap.

6. EU structural assistance to the CEECs

The role of the EU structural financing to less developed EU regions has been to boost the process of real convergence (*cohesion*), that is closing the development gap *vis-à-vis* the wealthier member states. The role of the EU pre-accession instruments to the applicant CEECs is to facilitate their *transition* process and to achieve convergence, that is to catch-up and join the EU. Transition refers to the process of transforming the former centrally planned economies into open market economies. This process requires fast rates of growth of the applicant CEECs and bears similarities with the cohesion process of lagging behind EU countries. As a result, the rationale and the structure of the EU instruments to facilitate cohesion, discussed so far, is very similar to the pre-accession EU instruments to facilitate transition, which will be discussed below.

6.1. Pre-accession EU funding

The enlargement of the EU to include the Countries of Central and Eastern Europe necessitated a formulation of the pre-accession strategy for all the applicant CEECs. The aim of this strategy, included in *Agenda 2000*, is:

- to provide a consistent and coherent programme for the preparation of these countries to join the Union;
- to provide with the Accession Partnership a single framework for the various forms of EU assistance;
- to make the applicants familiar with the procedures and policies of the Union so that they can participate in EU programmes.

Currently there are three pre-accession instruments for the period 2000-06, assisting the applicant countries until they join the EU: PHARE, ISPA and SAPARD. The last two instruments were decided at the Berlin Summit (March 1999).

PHARE was the instrument for the provision of EU financial structural assistance to candidate countries, since 1989 and up until 1999. For the period 2000-06, the PHARE financing amounts to about EUR 11 billion through co-financing support. It aims at promoting regional and social development, industrial restructuring, development of SMEs and especially at the consolidation of institutions. Its primary objective is the “institution building” and promoting convergence with the Community’s *acquis communautaire*.

ISPA (Instrument for Structural Policies for Pre-Accession) aims at the development of transport and environmental infrastructure. It enables the candidate countries to meet the EU environmental standards and supports the construction of trans-European transport networks. ISPA’s financial provisions amount to EUR 1,04 billion a year (at 1999 prices) over the period from 2000 to 2006 and they are to be divided evenly between environmental projects (including drinking-water supply,

treatment of waste water, solid-waste management and air pollution) and transport infrastructure projects of wider Community interest. The rate of assistance will be up to 75 per cent of eligible public expenditure but in exceptional cases up to 85 per cent. The allocation of ISPA among recipient countries has been decided by the Commission using criteria based on population, per capita GDP and land surface.

SAPARD (Special Accession Programme for Agriculture and Rural Development) aims at the modernization of agriculture, the promotion of the processing and marketing of products and rural development. SAPARD will be making an annual provision of EUR 520 million to future member states. By decentralizing management, the programme aims at giving experience to candidate countries in applying procedures for managing rural development programmes. However, its contribution to meeting the challenges in rural areas is limited.

The allocation of EU pre-accession funding over the period 2000-2006 between the ten eligible countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia)⁴⁶ is presented in Table 11, below.

	PHARE	SAPARD	ISPA ^(a)		Total	
			min	max	min	max
Bulgaria	100.0	52.1	83.2	124.8	235.3	276.9
Czech Rep.	79.0	22.1	57.2	83.2	158.3	184.3
Estonia	24.0	12.1	20.8	36.4	56.9	72.5
Hungary	96.0	38.1	72.8	104.0	206.9	238.1
Latvia	30.0	21.8	36.4	57.2	88.2	109.0
Lithuania	42.0	29.8	41.6	62.4	113.4	134.2
Poland	398.0	168.7	312.0	384.8	878.7	951.5
Romania	242.0	150.6	208.0	270.4	600.6	663.0
Slovakia	49.0	18.3	36.4	57.2	103.7	124.5
Slovenia	25.0	6.3	10.4	20.8	41.7	52.1
Total	1085.0	520.0	1040.0		2645.0	

Source: CEC (2001, p. 155); PHARE total annual budget is EUR 1,577 million.

(a) The allocation of ISPA, given as a range, is as follows: Bulgaria (8-12 per cent), Czech Republic (5.5-8 per cent), Estonia (2-3.5 per cent), Hungary (7-10 per cent), Lithuania (4-6 per cent), Latvia (3.5-5.5 per cent), Poland (30-37 per cent), Romania (20-26 per cent), Slovenia (1-2 per cent) and Slovakia (3.5-5.5 per cent).

It should be noted, finally, that the type of intervention of these pre-accession instruments is very similar to that provided by the Structural and the Cohesion Funds to the South-European countries. In particular, ISPA and SAPARD perform the same task as the Cohesion and the Agricultural Guidance and Guarantee Fund, also obeying to the same rationale. The eligible projects for financing are similar to those in the lagging behind EU regions. In terms of amounts, these funds represent a significant proportion

⁴⁶ Cyprus and Malta were associated with the Union in 1972-73 and received assistance in the past. For the period 2000-04 they will be receiving EUR 95 million.

of public investment, while the funds allocated under PHARE to the “institution building” prepare the candidate countries for managing the structural funds.

6.2. The effect of EU funds on CEE economies

An attempt to obtain an estimate of the likely effects of the EU pre-accession funds to the CEECs entails risks and difficulties, since we are faced with methodological and theoretical problems. Besides, the empirical evidence seems to be rather limited, since there are only two empirical studies, namely the *ex-ante* evaluations of the effect of structural programmes on the economies of Latvia and the German *Neue Länder*. Furthermore, these evaluations are somewhat mechanistic since they do not put the structural programmes into a wider perspective, relating them with the specific national features (micro-macro conditions, institutional setting, stage of development, etc.).

We shall briefly present the result of these studies, and in view of the experience with the CSFs of the cohesion countries, we shall make an effort to reach more general conclusions on the expected impact of the pre-accession funds on the CEECs.

In the case of *Latvia*, the EU structural intervention is an integral part of the *National Development Plan, 2000-02* (NDP). The size of the plan is significant, amounting to around 5 per cent of GDP per year on the average. The funding is provided by domestic and EU sources at roughly equal proportions, while there is a small contribution (0.5 per cent) by the private sector. Also, the expenditure of the plan is allocated to three categories. The bulk of investment is directed to the upgrading of physical infrastructure (over 65 per cent) and to a lesser extent as a direct aid to the private productive sectors (over 25 per cent, over half of it to agriculture). The improvement of human capital absorbs a rather small proportion (just over 5 per cent), which is much lower than the proportion allocated by the CSF in the cohesion countries (around 25 per cent).

The empirical evaluation of the effect of NDP on the economy of Latvia using the HERMIN model (Bradley, Kearney and Morgenroth, 2000) showed that the NDP could raise the level of the GDP by about 6.5 per cent above what it would be in the absence of the NDP programmes. This result hinges on the assumption that the NDP continues beyond the terminal year 2002, as it has happened with the CSF in the case of the cohesion countries. However, the analysis showed that if the programmes are poorly planned and executed, the beneficial impacts are likely to be more modest.

Note that the size of the Latvian NDP is comparable to the size of the CSFs in Greece and Portugal. Furthermore, the NDP effect on the Latvian economy is very close to that obtained in the *ex-ante* evaluation of the CSFs 2000-06 for Greece and Portugal, using *also* the HERMIN model (see Table 9, above). Of greater interest is the fact that a GDP unit of NDP is expected to contribute to the annual rate of Latvian GDP growth by 0.5 per cent, which is *also* the average contribution to growth of the European CSFs.

In the case of the *German Neue Länder* (East Germany), the structural intervention refers to the CSFs 1994-99 and 2000-06. The size of the former amounts to around 2 per cent of GDP per year, while for the latter declines gradually to around 1.2 per cent by 2006. The CSFs consist of major public investment projects aiming at

upgrading the physical infrastructure, the improvement of human capital and also providing aid to the private productive sectors.

The empirical evaluation of the effect of the CSFs on the economy of the Neue Länder is carried out also with the HERMIN model (Bradley, Morgenroth and Untiedt, 2000). The results showed that each one of the CSFs could raise the level of the GDP by around 4 per cent above what it would be in the absence of the structural programmes. The programmes could also reduce the level of unemployment by around 2 percentage points. The analysis also showed that the beneficial impacts are likely to be lower if the programmes are not implemented efficiently.

In the case of the Neue Länder the empirical evaluation showed that both CSF-2 and CSF-3 are expected to increase the GDP growth rate and lower the rate of unemployment in a very similar way to Latvia. In fact, a GDP unit of each East German CSF is expected to add 0.5 per cent to annual economic growth, as in the case of the CSFs of the cohesion countries. Also, a GDP unit of structural intervention is expected to decrease the unemployment rate by around 0.25 per cent, that is as much as the CSFs in the lagging behind European countries.

The similarity of these results to those obtained from the cohesion countries poses questions. The empirical results of the structural interventions in Latvia and the German Neue Länder seem reasonable and they are based on a precise scientific reasoning. But the issues raised in Section 5.4, relating mainly to the quantification of the supply side effects not only exist, but they are more acute here. In the absence of any empirical evidence, although the assumptions for the quantification of the supply side factors are analytically presented, we cannot be certain as to how close to reality they are. Besides, the fact that these results are so close to the average multipliers of the CSFs in the cohesion countries should make us very suspicious of these calculations. However, if these results are regarded as a broad indication of the expected order of magnitude of structural interventions to the CEECs, they are certainly useful.

7. Summary and conclusions

In this paper, we presented the aim and rationale of the EU structural funds, the CSFs, to the cohesion countries. We also discussed the channels through which the CSFs affect the economy and presented the methodology for the CSF macroeconomic evaluation. We then summarized and discussed the contribution of the CSFs to the cohesion countries, in particular their effect on aggregate economic activity and unemployment:

- The CSFs are structural reform programmes, consisting of specific actions for the improvement of physical and human capital. They are expected to improve the productivity of the economy as a whole by strengthening the endogenous growth mechanisms. The CSFs aim at enhancing the productive capacity of the economy; making the operation of the markets more efficient; and alleviating the social costs of adjustment.
- The positive impact of the CSF on the economy stems from the temporary demand-multiplier effects (boost in demand due to the inflow of EU funds) and also from the permanent supply effects (improvement of productive capacity due to the enforcement of the supply side factors).

- The assessment of the (macroeconomic) effects of the CSFs on the economy is approached using economy wide empirical models. The effects of demand side factors are easily quantifiable using the standard and well developed multiplier analysis. However, the precise quantification of the supply side effects is a difficult task due to less developed theoretical instruments and also due to limited, scarce and ambiguous empirical evidence.
- The empirical assessment of the CSFs effect suggests that they have an important bearing on the development of the cohesion economies. Also, there is no indication that the CSFs burden the inflation rate significantly nor that they affect the exchange rate adversely.
- The magnitude of the positive impact on economic activity varies depending on the model used, that is on our view of how the economy operates. The majority of models, including the HERMIN model which is used widely by the European Commission, arrive at optimistic estimates of the CSF effect on the cohesion economies: In broad terms and on the average, a GDP unit of EU funds is expected to rise economic activity of the recipient country by 0.5 percentage unit and to reduce the rate of unemployment by 0.25 percentage point. However, the results of models with different philosophy, such as the QUEST II model which is also considered by the European Commission, arrive at much lower estimates. Judging from my experience with the evaluation of the Greek CSFs, I would definitely opt for the more optimistic estimates.
- The discussion of the CSF effect on the economy refers to the expected (*ex-ante*) effect, on the assumption of full absorption and efficient implementation of the programmes. However, it is understood that the *ex-post* results will be more moderate, owing to the existence of various economic imperfections which curtail the beneficial impact of supply side effects of the programme. The deviation between *ex-ante* and *ex-post* results at an aggregate level is very difficult to be calculated, since it involves a detailed analysis of the particular actions of the whole programme. Furthermore, the empirical *ex-post* evaluation studies are limited to allow us to reach some conclusion only on this issue.
- The experience with the CSF impact on the economy showed that the beneficial impact is neither automatic nor predetermined. Very important is the role of accompanying macro-micro economic policies, introducing conditions of competition and economic stability, during the CSF implementation. The empirical results showed that sound policies and successful economic performance increased the beneficial CSF effect on the economy.

Also, we discussed the aim and rationale of the Pre-Accession structural programmes to the CEECs and on the basis of the experience of the cohesion countries with the CSFs, we drew conclusions on the likely effects of potential structural programmes to the transition countries:

- As an indication, the expected beneficial impact of potential structural programmes in the CEECs (such as the pre-accession structural funds) on economic activity should be comparable to the expected impact of the CSFs in the cohesion countries. This result is related to the fact that the pre-accession structural funds bear striking similarities in terms of rationale and structure with

the CSFs to the cohesion countries. Thus, it is reasonable to expect a GDP unit of EU financial structural assistance to the CEECs to give a boost to GDP growth of 0.5 per cent. Also, it could lower the rate of unemployment by around 0.25 per cent.

- However, the CEECs can take more (or less) advantage of the EU structural assistance to promote development and the catch-up process, which depends on the micro-macro policies they follow during the implementation of the programme. The implementation of liberalization policies and successful economic performance definitely increase the beneficial impact of EU assistance on growth and unemployment. Furthermore, the net result also depends on how efficiently the programmes are implemented.

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