Does cohesion policy work?

Some general considerations and evidence from Spain

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October 2002

1. Introduction

Over the last two decades, the EU has adopted an active *cohesion* policy aimed at reducing income disparities by subsidizing various types of investment programmes in the Union's poorest regions through the so-called Structural Funds. This policy has often been questioned on at least two different grounds. Perhaps the most common argument is that it has not worked: since most of the assisted regions continue to be relatively poor in spite of these programmes, EU grants are mostly a waste and should therefore be scrapped, or at least severely curtailed. The second objection, which is often not explicitly stated but often lurks behind calls for cuts in structural programmes, is based on the view that there is no reason why the EU should engage in redistribution across its constituent territories.

The Commission's view on this last issue seems to be that such redistribution is necessary because economic integration will tend to hurt the poorer regions of the Union by facilitating the concentration of economic activity in certain core areas. As has already been said this morning, this prediction seems to be based on an implicit assumption --that there are sharply increasing returns to scale-- for which there is very little empirical support. Hence, I do not think one can build a solid case for cohesion policies on the basis of the divergence predictions of the "new" growth and trade theories.

But I do not think that is necessary either. In my view, the case for redistribution must necessarily be based on political and equity considerations that have to do with what a typical European citizen would consider fair and would be willing to support when it comes to the budgetary policy of the Union. In this regard, I think we can validly extrapolate to the Community level the revealed preferences of European electorates as manifested in the policies of national governments-- provided we keep in mind that the typical taxpayer's willingness to pay for redistribution drops rapidly with his or her distance to the beneficiaries. While views about the desired level of redistribution vary widely across

member countries, my impression is that there is fairly broad support in Europe for a moderate amount of budgetary solidarity. This consensus has been clearly visible in EU budget practices, which have consistently resulted in sizable net transfers to the poorer member countries,[1] and has been incorporated into the Union's governing treaties in the form of an explicit commitment to economic cohesion and financial solidarity among member states.

Hence, I will take it as given that a certain amount of redistribution within the EU is desirable. Given this, it probably makes sense that at least some of this redistribution should be achieved through conditional investment grants with "additionality" requirements and some sort of quality filter to make sure that the funds flowing into the poorer territories are effectively used to promote their development and are not diverted for consumption purposes.

This leaves me with two questions to which I will devote the bulk of my intervention. The first one is whether we can reasonably expect that EU cofinancing of infrastructure and training programmes will contribute to growth and convergence, and the second one has to do with the level at which redistribution should be conducted. On the first issue, I am cautiously optimistic. I will argue that supply-oriented regional policies can work in principle and have actually worked quite well in the case of Spain, at least when judged in terms of their stated objectives. My argument will be based on a brief review of the available empirical evidence on the growth effects of investment in infrastructure and education (section 2), and on some estimates of the impact of the Structural Funds in Spain (section 3). On the second issue, I will argue that EU cohesion policy should be formulated at the national rather than at the regional level, essentially because member states already have adequate systems for internal redistribution.

2. Can regional policy work?

There is considerable disagreement among both academics and policymakers concerning the effectiveness of the Structural Funds (and of regional policies in general) as instruments for the reduction of income disparities. Many critics of these programmes argue that they cannot be very effective on the grounds that billionaire expenditures over two decades have not translated into clear progress in terms of regional convergence. An academic exposition of this view can be found in a recent paper by Boldrin and Canova (2001). These authors examine the evolution of the distribution of income across the EU regions over the last two decades and find no evidence that convergence is taking place or that recipients of EU transfers (with the exception of Ireland) have performed better than other regions. As the less formal versions of the same argument, however, their analysis has the serious shortcoming that it fails to control for any factors other than EU aid.

A recent paper by Ederveen, Gorter and Nahuis (2001) illustrates why the results obtained in this manner can be extremely misleading. These authors estimate a series of convergence

[1] See de la Fuente and Doménech (2001) for an analysis of the redistributive impact of the EU budget.

equations relating growth in the European regions to initial income per capita and Structural Fund transfers. When no additional variables are included in the equation, the estimated coefficient on the transfers variable is negative and significant. When regional fixed effects are introduced, however, the coefficient of EU transfers becomes positive and significant. Upon reflection, these results should not be surprising. Since the recipients of EU aid are by definition poor regions, the volume of aid works as a proxy for the omitted variables that presumably explain why these regions have below-average incomes. The estimated coefficient on the volume of aid is negative because this is the only way the specification allows to assign to these territories a low steady-state level of income. But as soon as we control for other factors, even by the simple expedient of introducing a set of regional dummies, the positive impact of aid on growth becomes apparent.

A more sophisticated, although indirect, case against regional policies can be found in some papers in the regional convergence literature (see Barro and Sala i Martin (1991) and especially Sala i Martin (1996)). While these authors find that the speed of regional convergence is very low in Europe and in other samples, they are also skeptical about government's ability to speed up the process. The main piece of evidence they offer to back up this conclusion is a remarkable empirical regularity: the apparent stability of the rate of convergence, which has been found to be close to 2% a year in a variety of samples. According to Sala i Martin, the fact that convergence takes place at practically the same speed within groups of territories supposedly characterized by very different levels of redistributive effort implies that such policies cannot be very effective.

This conclusion seems, however, much too hasty. Governments can certainly influence the rate at which regions accumulate various productive factors - particularly infrastructures and human capital. To the extent that these factors have an effect on productivity, and on the location of mobile private inputs, there will be room for supply-side policies to influence the dispersion of regional incomes and to promote or accelerate income convergence. From this point of view, the stability of the convergence coefficient across different samples may indicate that the level of redistributive effort has been too small to have a noticeable effect on the evolution of income disparities, and/or that the policies adopted in the past have not been very effective, but it cannot be taken as evidence that regional policy per se is necessarily ineffective.

Can investment in infrastructures and education increase productivity?

Since EU regional policy has essentially taken the form of conditional grants for the financing of training and infrastructure projects, the discussion about its effectiveness should begin with an analysis of the contribution of these two types of investment expenditures to productivity growth. Although the issue is, as we will see, somewhat controversial, I believe that the existing evidence provides reasonable support for the view that expenditure on

education can have a considerable effect on productivity growth, and that the same holds true for infrastructure investment, at least in regions where the endowment of this factor is relatively low.

Academic economists have traditionally been inclined to consider educational expenditure a key component of national investment with a substantial economic payoff in terms of output growth, and have often assigned to the accumulation of human capital a central role in formal models, particularly in the recent literature on endogenous growth. This optimism seemed to be confirmed by a first round of cross-country empirical studies of the determinants of growth, where a variety of educational indicators were consistently found to have the expected positive effect. A second round of such studies (characterized by the use of panel data techniques), however, produced rather disappointing results and even led some researchers to explicitly question the link between education and productivity.[2] In recent years, the evidence seems to be accumulating that such negative results were largely due to poor data and various econometric problems. The current state of thinking about this issue is probably well summarized by Temple (2000) who, after surveying the relevant micro and macroeconomic evidence, concludes that "the weight of the evidence points to significant productivity effects" of educational investment. Some recent work by R. Doménech and myself (2002) helps support this conclusion. We find, in particular, that the amount of measurement error in the educational data sets that have been used in most growth studies is very considerable and that this induces a large downward bias in the estimated coefficient of human capital in the aggregate production function. When this bias is corrected using an extension of the classical errors-in-variables model, the results suggest that the contribution of educational investment to productivity growth is quite sizable.

The degree of consensus on the productivity effects of infrastructure investment is probably much smaller. The issue has been the subject of a debate that is still ongoing in the literature. The available empirical evidence is problematic and its interpretation is complicated by econometric problems that have not been fully solved yet. Early work on the subject, notably by Aschauer (1989), concluded that the elasticity of national or regional output with respect to public capital is large and very significant, and that the rate of return on public investment is exceedingly high. A number of more recent studies, however, have questioned these results on the basis of various econometric problems. Some of these studies find that the significance of public capital disappears when a specification in first differences is used or fixed effects are introduced to control for unobserved national or regional specificities, and conclude that the accumulation of public capital does not appreciably contribute to productivity growth. Other recent papers, by contrast, confirm the significance of infrastructure indicators using

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[2] Positive results are reported, among others, by Mankiw, Romer and Weil (1992) and Barro and Lee (1994), while Islam (1995) and Caselli et al (1996) and other authors report the loss of significance of schooling indicators in fixed effect specifications. Prittchet (1995) also reports negative results and argues that we should start taking them at face value.

cointegration or panel data techniques that should in principle take care of some of the main objections to Aschauer's results. Some of them (especially Fernald (1999)) also provide rather convincing evidence that causation runs from infrastructure investment to productivity growth, and not the other way around.

De la Fuente (2002a) surveys the available evidence and concludes that there are sufficient indications that public infrastructure investment contributes significantly to productivity growth, at least in countries or regions where a saturation point has not been reached. The returns to such investment are probably quite high when infrastructures are scarce and basic networks have not been completed, but fall sharply thereafter. Hence, appropriate infrastructure provision is probably a basic ingredient for a successful (regional or national) development policy, even if it does not hold the key to rapid productivity growth in advanced countries where transportation and communications needs are already adequately served. This conclusion is based in part on a comparison of existing results for the regions of Spain and the states of the US. Public capital variables are almost always significant in panel data specifications for the Spanish regions, and often insignificant in similar exercises conducted with US data. One possible explanation for this difference is that, as Fernald (1999) notes, the existing data for the US states start in 1970, i.e. at approximately the time when the interstate highway system was completed, whereas the Spanish data refer to a sample where the stock of infrastructures is still clearly insufficient.

3. Some impact estimates for Spain

Even though the existing evidence on the subject is not as clear as one would like, on the whole, the literature that I have briefly surveyed in the previous section suggests that investment in education and infrastructure is an important source of productivity growth. It follows that a regional policy aimed at reducing regional disparities by supporting the accumulation of these factors in poor regions can work in principle.
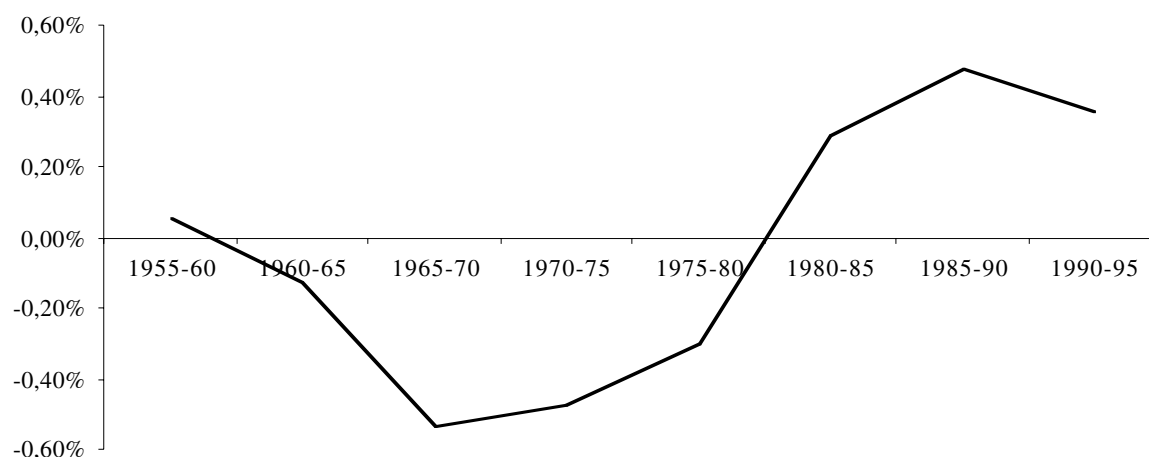
In this section I will provide some estimates of the impact of regional policies on growth and convergence in the Spanish regions. These estimates are based on a simple supply-oriented model that has been estimated with regional panel data covering a period of 30 years. The model has two basic ingredients. The first one is an aggregate production function which relates regional output to the level of employment, the stocks of productive factors (infrastructures, other physical capital and the educational attainment of the workforce) and to the level of technical efficiency. The second component of the model is an employment equation which describes the evolution of this variable as a function of changes in factor stocks and in wage rates, allowing in an ad-hoc fashion for adjustment costs that generate sluggish dynamics.[3] I will also make use on an investment function estimated with national

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[3] See de la Fuente (2002b) for the details of the model and its estimation.

data for a sample of OECD countries to try to approximate the response of private investment to the measures financed by the Structural Funds.[4]

Figure 1: Beta convergence/divergence in relative income per capita induced by investment in productive infrastructures

- Source: de la Fuente (2001)

Before turning to the Structural Funds per se, I want to take a quick look at the evolution of Spanish infrastructure policy over the last four decades. The model I have sketched above can be used to estimate the contribution of infrastructure investment to convergence in income per capita across the Spanish regions. Figure 1 summarizes the results of this calculation for each quinquennium between 1955 and 1995.[5] It shows that Spanish infrastructure investment was not redistributive at all prior to 1980. After this date, by contrast, the redistributive pattern is clear and the contribution to regional convergence becomes positive and sizable. Although the policy shift actually starts a bit before Spain's accession to the EU (which took place in 1986), there is little question that the Structural Funds have played a key role in it by channeling a large volume of infrastructure investment into lagging regions.

The effects of the 1994-99 Objective 1 CSF

In the remainder of this section I will use the same model to produce estimates of the contribution of the last completed Community Support Framework (CSF) to the growth of output and employment in the poorer Spanish regions.[6] The exercise is based on the

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[4] This function is the one estimated in de la Fuente (1997). I would have much preferred to estimate an investment function for the Spanish regions, but some of the required data are not available.
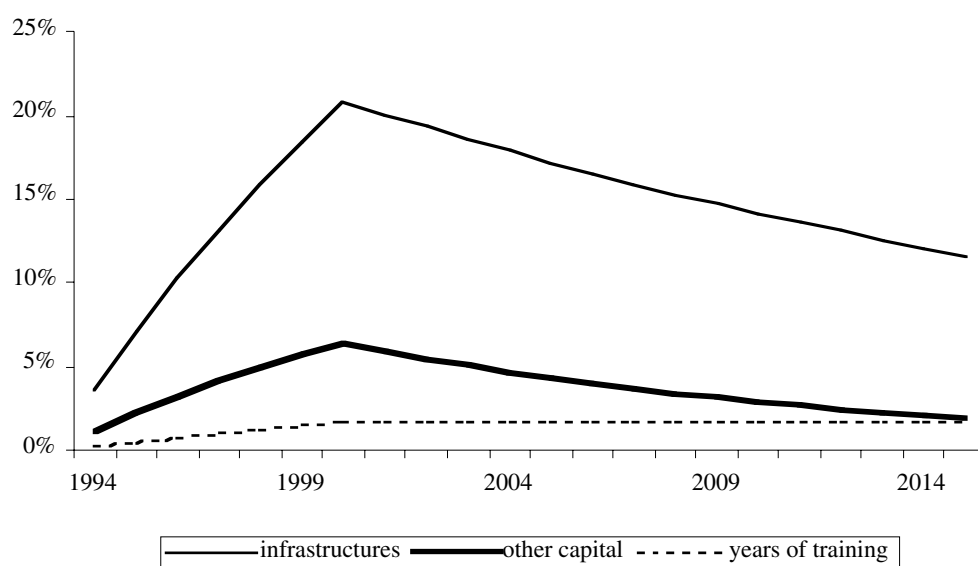
[5] The figure shows the partial convergence coefficient induced by infrastructure investment in each period. This parameter measures the rate of beta convergence that would have been observed if all regions had experienced similar growth rates except for the contribution of infrastructure investment. For further details on its meaning and construction see de la Fuente (2002c).

[6] This section is based on de la Fuente (2002b).

assumption that investment projects that are cofinanced by the EU are no different from others of the same nature. This assumption may be a bit too optimistic because, by reducing marginal costs, EU subsidies may have made for somewhat laxer project selection standards than otherwise, but I am reasonably confident that it is not a bad approximation.

The calculations that follow attempt to quantify the contribution of all the public resources chanelled through the CSF (including national co-financing as well as EU grants) and of the induced change in private investment to growth in output and employment during the period 1994-2000. The calculation involves adding these flows of resources to observed 1993 factor stocks and using the estimated production and employment functions to calculate the resulting increase in the variables of interest over their observed values in the reference year. The results should be interpreted with caution because (among many other things) they do not provide a valid response to the question of what would have happened if the Structural Funds had not existed. To answer this question, we would need to know how the Spanish administrations would have reacted to the loss of these funds. It is almost certain that they would have made up at least part of the loss using their own budgets, but it is hard to be more precise. As a rough adjustment for this and for the fact that the CSF also includes national resources, I would suggest multiplying my impact estimates by around 1/2 to get a guesstimate of the true marginal contribution of EU cohesion policy.

Figure 2: Cumulative impact of the 1994-99 CSF on factor stocks entire Objective 1 territory

Figures 2 and 3 show the cumulative impact of the CSF on the stocks of productive factors and on the levels of output and employment of the entire set of Objective 1 regions (excluding Ceuta and Melilla) during the period 1994-2015. Figure 2 shows that the CSF can be seen as a large positive "shock" that, over a period of seven years, raises aggregate factor stocks

significantly above their starting levels (up to 20% in the case of infrastructures). Once the Framework has been executed (and assuming there are no new interventions), the stocks of physical capital and infrastructures are allowed to gradually return to their original levels as CSF-financed investments depreciate. The impact on the stock of human capital, by contrast, remains constant until the end of the working life of the beneficiaries of training programmes which, on average, will take place after the end of the period covered in the figure.

**Figure 3: Cumulative impact of the 1994-99 CSF on output and employment
entire Objective 1 territory**

Figure 3 traces out the impact of these shocks on the evolution of output and employment. As may be expected, the output effect has approximately the same profile as factor stocks, and begins to decline as soon as the Framework has been completely executed. The time path of employment, on the other hand, is very different from the previous one. Since this variable adjusts sluggishly over time, net job creation remains positive until about 15 years after the conclusion of the programming period.
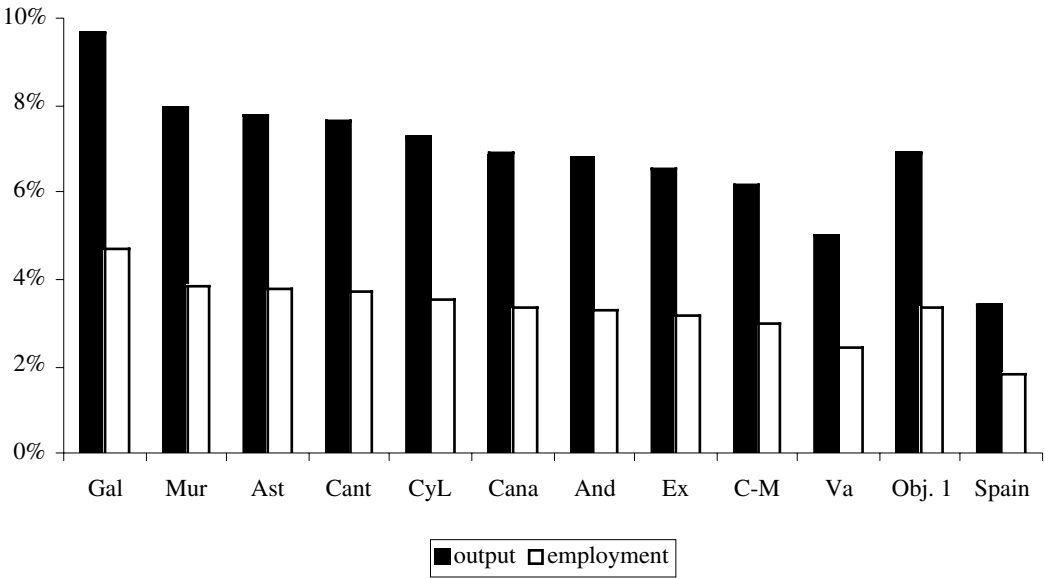
Figure 4 summarizes the cumulative impact of the Framework on the output and employment of each of the Objective 1 regions in 2000. The figure shows that the growth effects of the CSF vary significantly across territories, reflecting differences in both the volume of investment and in its rate of return. For the Objective 1 regions as a whole, the Framework adds 6.9 percentage points to output and 3.4 points to employment in 2000. When we take as our reference the entire country, the CSF's cumulative contributions to Spanish growth and employment in the same year are of 3.5 and 1.85 points respectively.

Figure 5 quantifies the Framework's contribution to convergence in income per capita between Objective 1 regions and the rest of the country. It shows a *convergence ratio* that
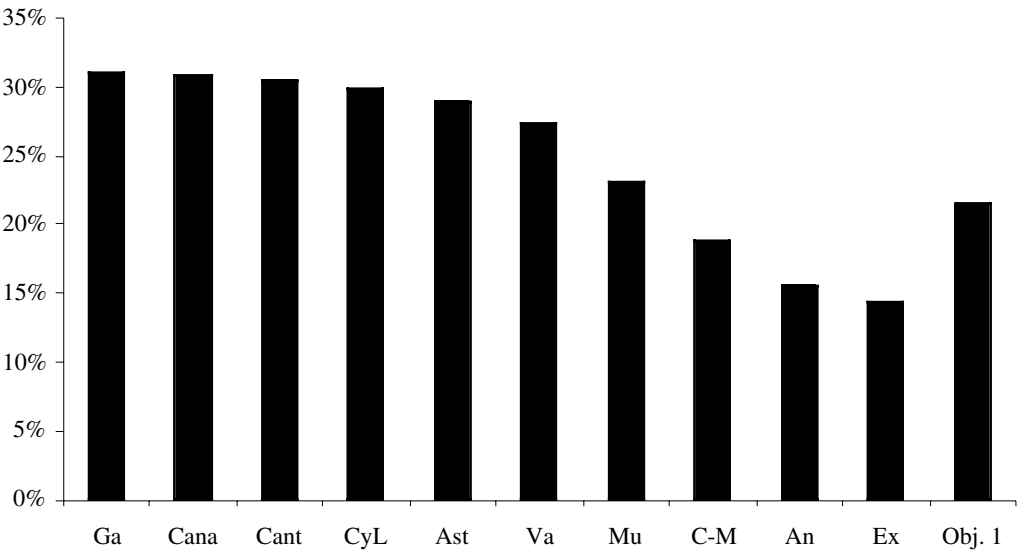
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measures the fraction of the original income gap that would have disappeared as a result of the execution of the Framework (if the population of the different regions had remained constant over the sample period and growth performance had been uniform across them except for the effects of the CSF). For the whole of the Objective 1 territory, this coefficient is a bit over 20%, and reaches values above 30% for Canarias, Cantabria and Galicia.
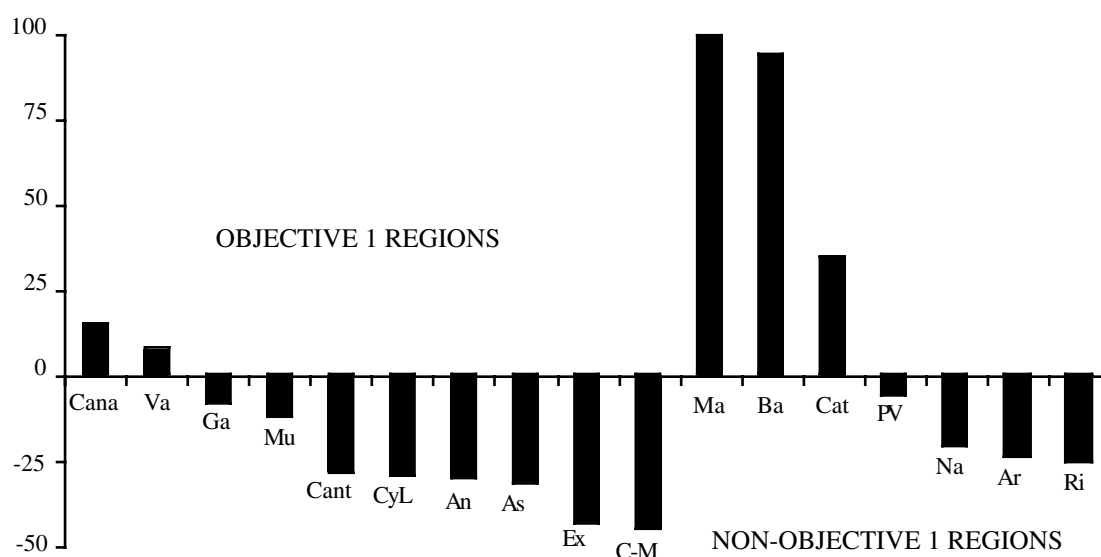
Figure 4: Cumulative impact of the CSF in 2000

Figure 5: Convergence ratios induced by the CSF

4. Cohesion across countries or across regions?

The estimates I have presented in the previous section suggest that structural policies have worked quite well in Spain. They have, in particular, contributed significantly to the growth of the poorer regions and to the reduction of regional disparities. It must be recognized, however, that focusing on lagging regions entails a sizable efficiency cost and may not be optimal from a national perspective. Figure 6 shows why. The estimated returns on public investment are much higher in some of the richest Spanish regions than in most of the territories that are eligible for assistance under Objective 1. It follows that the overall impact of EU aid would have been considerably higher (and Spain's convergence toward average EU income correspondingly faster) if efficiency considerations had been given greater weight in the allocation of these funds.

Figure 6: Relative marginal product of infrastructures in the Spanish regions, 1995

- *Note:* percentage deviations from the national average.

I am not sure that shifting structural assistance towards the richer regions of the cohesion countries is necessarily optimal, as this would certainly entail some cost in the form of greater internal inequality in output per capita. On the other hand, this cost will be substantially mitigated by the operation of the standard mechanisms for personal redistribution that opearate within (but not across) countries. The social protection and tax systems of European countries will redirect a significant part of any income gains from more efficient investment policies towards the poorer segments of the population. For the case of Spain, I have estimated that a policy shift in this direction would generate a net welfare gain.[7] This may not be the case elsewhere, but I would argue that member countries should certainly be free to

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[7] See de la Fuente (2002d).

distribute EU development funds across regions as they see fit, after weighting the relevant costs and benefits. Or, to put it in a slightly different way, that cohesion policy should be formulated at the national rather than at the regional level because member countries have adequate mechanisms for internal redistribution.

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