

CPB Discussion Paper

No 15

November 2002

Does European cohesion policy reduce regional disparities?

An empirical analysis

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The responsibility for the contents of this CPB Discussion Paper remains with the author(s)

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ISBN 90-5833-115-6

Contents

Abstract	5
1 Introduction	7
2 The rules of the game	9
3 Redistribution	11
4 Cohesion policy in growth theory	13
5 The regression	15
6 Conclusion	19
7 References	21

Abstract

European cohesion policy entails predominantly the funding of infrastructure and employment projects in lagging regions of EU Member States. It involves the distribution of more than 35 billion euro annually, making it the second most important EU policy in budgetary terms. Its main aim is to reduce regional disparities in regional welfare. This paper investigates to what extent European cohesion policy achieves this aim. The data reveal poorer regions do tend to receive more cohesion support. The policy thus satisfies a necessary condition for its effectiveness. It remains, however, unclear whether cohesion support significantly increases economic growth. In particular, the more independent convergence one presupposes, the less well cohesion support appears to work. This points at a clear trade-off: either one accepts that regional disparities are here to stay, or one concludes that cohesion policy fails.

1 Introduction

The EU attempts to reduce differences in regional welfare. It does so by funding programs in regions that lag behind in production per capita, over-rely on industries in decline, or face high unemployment. These programs intend to enhance infrastructure, restructure industries, or modernise education. This practice has come to be known as ‘cohesion policy’. At present it involves the redistribution of more than 30 billion euro annually, no less than one third of the EU budget.

There is no consensus on the effectiveness of cohesion policy.¹ On the one hand, the European Commission is unequivocally positive. It claims: “The Structural and Cohesion Funds do not only stimulate demand by increasing income in the regions assisted. By supporting investment in infrastructure and human capital, they also increase their competitiveness and productivity and so help to expand income over the long-term” (European Commission, 2001, p. xxi). On the other hand, observers such as Boldrin and Canova are downright negative. They state: “we cannot find any clear sign [that] EU policies, as opposed to other social and economic factors, are actually reducing [...] disparities. Our conclusion is that regional and structural policies [...] have little relationship with fostering economic growth” (Boldrin and Canova, 2001, p.206).

What explains the gap between these positions? The European Commission bases its conclusions on simulations with macro-economic models. In these simulations cohesion support, in the form of the Structural and Cohesion Funds, translates directly into productive public investment. The simulation outcomes are therefore to be interpreted as the *potential* impact on economic growth. They constitute an upper bound on effectiveness. Boldrin and Canova base their conclusion primarily on the observation that convergence between European regions decelerated precisely when cohesion policy seriously took off in the 1980s. They do point out that without cohesion policy convergence could have been even slower. The onus of proof rests, however, with proponents of cohesion policy.

The true effectiveness of cohesion policy lies probably somewhere in between these two extremes. Econometric analysis yields, by directly relating regional economic growth to cohesion support, an assessment of the *actual* impact of cohesion policy. This paper constitutes such an assessment. It builds on the few pre-existing studies by making use of the best-available data sources, and by assembling in a single framework distinct identifying assumptions about steady states of regional economic growth. The latter is important because both the size and sign of the estimate depend on these assumptions. The more independent convergence one presupposes, the less likely it is that cohesion policy works, and vice versa.

¹ For a survey of the literature on the impact of cohesion policy on convergence and economic growth, see Ederveen et al. (2002).

2 The rules of the game

The present institutional design of cohesion policy dates back to 1999. In that year the European Council of Berlin agreed upon 'Agenda 2000', a reform of a number of important EU policies. Four 'Structural Funds' were (re)established. They are:

- The European Regional Development Fund (ERDF). It finances primarily investment in infrastructure and employment, but also initiatives of small-scale businesses;
- The European Social Fund (ESF). It supports programs that aid the integration of the unemployed or otherwise disadvantaged groups on the labour market.
- The Guidance Section of the European Agricultural Guidance and Guarantee Fund (EAGGF). It supports farmers and finances programs for the development of rural areas;
- The Financial Instruments for Fisheries Guidance (FIFG). It aims at restructuring and modernising the fishing fleet.

In addition, a separate 'Cohesion Fund' was consolidated. It finances environmental and transport projects in Greece, Ireland, Portugal and Spain in order to enable these poorer Member States to participate in the economic and monetary union without undermining these types of public investment. Finally, there are a number of small funds for the Central and Eastern European Countries that will enter the EU in the near future. We ignore them on account of their relatively small size.

The bulk of the four Structural Funds is allocated according to three 'Objectives':²

- Objective 1 is to help lagging regions catch up with the rest of Europe by providing basic infrastructure and encouraging business activity. Regions with a GDP per capita of less than 75% of the Community average qualify for this type of funding;
- Objective 2 is to help the economic and social restructuring of regions dependent on industries in decline, agriculture, fishery, or areas suffering from problems specific to urbanisation. Eligibility for objective 2 funding is complex. In order to qualify industrial regions must have an unemployment rate above the Community average, a higher percentage of jobs in the industrial sector than the Community average, and a decline in industrial employment. For rural or other types of regions similar sets of requirements apply. Moreover, regions must not be eligible for objective 1 support.³
- Objective 3 is to modernise education and increase employment. This type of funding is Community wide. Any region may qualify, provided that it does not receive objective 1 funding.

² The three present Objectives replace six previous Objectives.

³ For a detailed description see European Commission (1999).

Most of the remainder of the Structural Funds goes to Community Initiatives, programs initiated by the EC to promote interregional cooperation in solving common problems. The allocation of the Cohesion Fund follows, however, its own rules. It goes to Member States with a gross national product (GNP) per capita of less than 90% of the Community average. These are Greece, Ireland, Portugal and Spain. Ireland has experienced a rapid economic development over the last decade, and will leave the group of cohesion countries.

The complexity of cohesion policy partly stems from the coexistence of several funds. Some are allocated according to several objectives and Community Initiatives, others according to their own set of rules. In addition, some funds benefit regions, others Member States, and yet others particular sets of projects across the entire EU. ERDF support for regional Objective 1 programs is, however, of prime importance. Hence, this type of funding determines the thrust of cohesion policy.

Redistribution

If cohesion policy is to foster convergence it should redistribute funds from rich to poor. The funds allocated to objective 1 are earmarked for regions with a GDP per capita of less than 75% of the EU average. Moreover, the Cohesion Fund goes to Member States with a GNP of 90% of the EU average. For this reason we do expect to find considerable redistribution. Nevertheless, the myriad of Funds, Objectives and Community Initiatives allow even the richest regions to draw down some resources.

In order to get an idea of the extent of redistribution, we regress (the log of) cohesion support per capita on (the log of) GDP per capita for NUTS II⁴ regions. A negative slope coefficient indicates that the richer a region is, the less cohesion support it receives. The absolute value gives the percentage decrease of cohesion support per capita, per percentage increase of GDP per capita.

The allocation of Objective 1 funding obeys the NUTS II level of aggregation. Nevertheless, cohesion support per capita is not readily available for NUTS II regions. Some projects -such as the ones under the Cohesion Fund- are booked under a national header. Thus, in calculating the amount of total cohesion support for NUTS II regions, one must make certain assumptions. We assume that the non-regional funds (predominantly the funds allocated to Objective 3, the Cohesion Fund, and the funds under objective 1 and 2 not yet distributed to separate regions) are allocated to individual regions in proportion to their population. In doing so, we take the institutional design of cohesion policy into account, in particular that Objective 1 regions are not eligible for Objective 2 and 3, and vice versa. For 183 out of 210 NUTS II regions it proved possible to obtain a reasonable estimate of total cohesion support, and thus of total cohesion support per capita.

We use GDP per capita as a measure of welfare. Two considerations underlie this choice: first, GDP per capita is consistent with the allocation of most cohesion support since Objective 1 funding is driven by this very measure; second, reliable panel data are available at distinct levels of regional aggregation. Moreover, it is possible to control for differences in cost of living between Member States by using purchasing power parities. Nevertheless, GDP per capita has its shortcomings. One may want to use a broader welfare concept, explicitly including education, health, intra-regional income variation, and environmental quality. Furthermore, interregional

⁴ EUROSTAT, the EU statistical office, decomposes the Union into four sets of regions: the first set comprises the 15 individual Member states; the second set comprises large parts of member states such as Oost-Nederland or Bayern (78 regions); the third set comprises somewhat smaller administrative unit such as Dutch provinces or German 'Regierungsbezirke' (210 regions); and the fourth and finest set comprises agglomerations and their surrounding countryside such as Arnhem-Nijmegen or München (1093 regions). These four sets are labelled, respectively, NUTS 0, NUTS I, NUTS II, and NUTS III, where NUTS stands for 'nomenclature des unités territoriales statistiques'. In some cases, one and the same region pertains to several NUTS categories.

imbalances in commuting cause biases. Unfortunately, data limitations prevent addressing these issues.

Figure 3.1 displays the degree of redistribution. Each of the 183 NUTS II regions is indicated by a dot. Ipeiros, one of Europe's poorest regions is also one of the main beneficiaries; for Inner London, one of Europe's richest regions, the reverse holds true. Flevoland, in terms of GDP per capita an average region also receives an average amount of cohesion support. The slope of the regression line clearly negative, indicating some degree of redistributive efficiency. The absolute value of the slope coefficient is 3. This means that a 1% increase in GDP per capita implies a 3% reduction in cohesion support per capita.

Figure 3.1 Income redistribution at a regional level

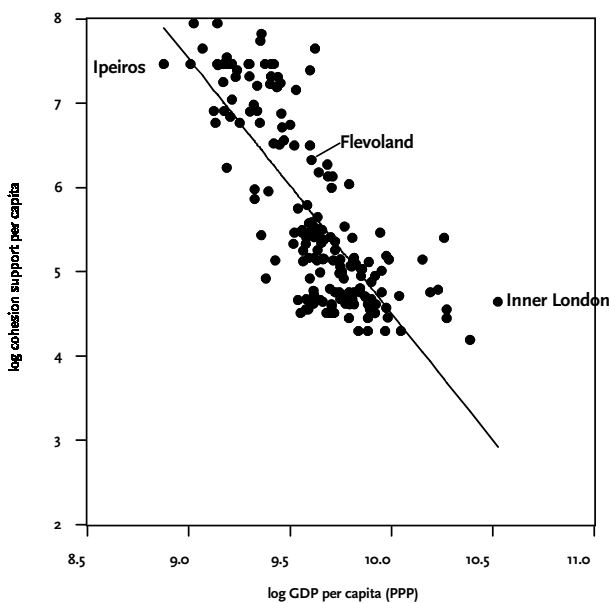


Figure 3.1 confirms that, although poor regions receive relatively much support, rich regions still receive some. This mitigates the redistributive impact of cohesion policy. It is allowed by the 'thematic' (as opposed to territorial) focus of a number of funds. All regions appear to be successful in drawing down funds in the inevitable political bargaining that the allocation process entails. Moreover, 'phasing out' arrangements create inertia: a region that has received funds in the past is more likely receive funds in the future.

4 Cohesion policy in growth theory

Various economic theories of economic growth allow a positive role for cohesion policy. The Solow growth model (1956) entails a production function, a savings function, and (exogenous) technological progress. Diminishing returns to capital imply that an economy grows towards its 'steady state' in which investment is just sufficient to maintain the current capital stock. The model predicts convergence: the further a region is from its steady state, the faster it grows. Cohesion policy adds to convergence if it increases the stock of public capital. This increases the productivity of private capital, pushes out the steady state, and raises the growth rate.

In Romer's (1986) wake, a variety of endogenous or new economic growth models have been developed. They have in common that there are no decreasing returns to capital, which should be interpreted broadly, encompassing physical capital as well as human (Lucas, 1988), public (Barro, 1990), and technology capital (Grossman and Helpman, 1991). Decreasing or increasing returns to efforts to generate knowledge determine whether economies converge or diverge (Sala-i-Martin, 1996). According to this strand of theory cohesion policy should be directed at making these efforts more effective.

Fagerberg (1987) adheres to the technology gap perspective. He stresses that lagging economies progress by imitation. Successful imitation is, however, conditional on certain factors. There is evidence that a high level of research and development and a focus on technologically progressive industries are among these factors (Cappelen et al., 2001). If regions spend cohesion support on promoting indigenous technological progress, exploiting technologies developed elsewhere, or the capacity to utilise existing technological potential, then its productivity converges more rapidly to the levels of more advanced regions.

The agglomeration forces prevalent in the new economic geography literature bring about a clustering of economic activity (Krugman, 1991). The line of reasoning is that if a firm locates in, say Berlin, then it is more attractive for a second firm to locate there as well instead of in Brandenburg or Mecklenburg-Vorpommern. This holds true *a fortiori* for subsequent firms until centrifugal forces such as rising wages and congestion bring about an equilibrium. Cohesion support for Brandenburg and Mecklenburg-Vorpommern is probably insufficiently potent to tip the balance in favour of these lagging regions, and to reverse the agglomeration dynamics that prevail at present. Nevertheless, it could perhaps retard the process or, depending on how it is spent, support an equilibrium with a more equal distribution of economic activity. Note, however, that it obstructs the reaping of the increasing returns to scale gains that are associated with agglomeration. Thus, unlike in the Solow growth model, the endogenous growth theory, and the technology gap frameworks there is an equity-efficiency trade off here.

Cohesion policy is not *necessarily* effective in fostering convergence. Its positive impact under either strand of models is conditional. In the Solow growth model, cohesion support should

increase the macro-economic savings rate. If it crowds out national public investment then it exerts only a temporary demand effect on the economy. Dignan (1995) and Ederveen and Gorter (2002) find that once national governments receive aid from Brussels, they may retrieve their own funds for regional projects in lagging regions. The EC recognises the problem since it requires cofunding from national governments. Bachtler and Taylor (1996) claim, however, that the documents upon which the allocation of the cohesion support is based are little more than a paper exercise, designed to legitimise EU co-financing of predetermined regional projects.

Cohesion support may replace alternative economic processes that bring about convergence. In particular, Boldrin and Canova (2001) point out that cohesion support might induce labourers to remain in poor regions where they would otherwise have migrated to richer regions. Since labour mobility is a powerful means to achieve wage equalisation, cohesion support thus retards convergence. Some opponents of cohesion policy put that it boils down to subsidising unemployment. Although this is perhaps an exaggeration, it may contain a grain of truth.

Cohesion policy does redistribute funds from rich to poor regions. We have pointed out, however, that even the richest regions receive some support. This obviously weakens the impact on convergence. Moreover, Martin (1998) argues that redistribution is less strong than is often believed. If one considers only those projects that are likely to contribute most to the stock of public capital (Martin calls this type of projects “investment in the productive sector”) then the spread of cohesion support is much more even among regions. Redistribution is weakened further if one takes regional policy of nations into account. In particular, Martin (1998b) points out that rich Member States tend to be relatively active in supporting regions that are relatively poor from only a national perspective.

The rate of return of projects financed by the EU may be relatively low. One reason is that they are typically based on a distorted cost-benefit analysis. In particular, regions consider the full benefits of a project, but do not take cohesion support into account when assessing the costs. Thus, at the margin the social rate of these projects is rather low. Admittedly, this is to a certain extent this what cohesion policy is supposed to achieve: to support projects that would otherwise not have been undertaken. There is, however, another reason why the return of projects may be low. Cohesion policy induces rentseeking: it provides an incentive to propose projects that are most likely to attract support instead of the projects with the highest social return. This problem becomes acute just before the submission deadline, when regions with excess funding feverishly look for extra projects.

5 The regression

We set out to estimate the impact of cohesion support on convergence. Given that cohesion policy redistributes funds from rich to poor, it is sufficient that cohesion policy fosters regional economic growth.

We use the reduced form regression equation⁵

$$\hat{y}_{i,t} = \beta_1 + \beta_2 \ln y_{i,t-1} + \beta_3 x_{i,t} + \beta_4 D_i + \epsilon_i$$

The independent variable, $\hat{y}_{i,t} \equiv \ln y_{i,t} - \ln y_{i,t-1}$, denotes the annual growth rate of GDP per capita of region i in year t . The equation includes GDP per capita in of the preceding year, $\ln y_{i,t-1}$, since diminishing returns to scale as well as a technology gap suggest independent catching up of less productive regions. Cohesion support, $x_{i,t}$, is expressed as a proportion of regional GDP in order to correct for regional differences in economic size. The vector D_i includes dummies that control for other factors than initial productivity and cohesion support that contribute to growth. Finally, ϵ_i denotes the error term.

There are three obvious choices for D_i : the first is not to include dummies altogether; the second is to include country dummies; the third is to include region dummies. The advantage of the first choice is that it saves degrees of freedom and thus makes the estimators more efficient. However, it presupposes absolute convergence. It comes down to assuming that, as time goes to infinity, Ipeiros and Inner London will approach the same level of productivity. The second choice makes convergence conditional on whether a region lies in a particular country. Thus, it allows for different steady states of productivity between Greek and British regions, but not for regions within the UK or Greece. The third choice allows persisting differences between regional productivity levels. In this case each region dummy will have to be estimated on the basis of a few time series observations only. Hence one cannot put much confidence in their estimates. This does not, however, disqualify $\hat{\beta}_2$ and $\hat{\beta}_3$ since errors cancel out across the board.

The panel that we use to estimate the regression equation includes data for all the 183 NUTS II regions for which we were able to calculate the total amount of annual cohesion support. The raw data underlying the panel come from the European Commission (1997). EUROSTAT provides the data on GDP and population. They comply to the 1979 European System of Accounting (ESA). The panel spans the period from 1981 to 1996. GDP data for later years are only published in accordance with the in 1995 revised accounting system. Because these

⁵ The equation is consistent with various growth models. Ederveen et al. (2002) derive it formally from a variant of the Solow growth model.

different definitions lead to substantial differences at the regional level, the former system is used exclusively. The first year of data availability differs between the regions, but for most of the regions data are available from 1981. Since the Commission uses the same GDP per capita data as a key for eligibility for Objective 1. This introduces some degree of colinearity between GDP per capita and cohesion support. There is, nevertheless, enough independent variation to be able to estimate the corresponding coefficients.

Table 5.1 shows the results of the three specifications of the regression. The constant, which is an increasing function of the unexplained growth rate as time goes to infinity, is highest for Luxembourg and lowest for Greece under the assumption of country-specific steady states. Thüringen and Ipeiros end up as the fastest and slowest growing region under the assumption of region-specific steady states. None of these estimates are, however, statistically significant.

	absolute convergence	country-specific steady states	region-specific steady states
constant	0.66* (0.030)	Highest: 0.83 (Luxembourg) Lowest: 0.77 (Greece)	Highest: 1.19 (Thüringen) Lowest: 1.06 (Ipeiros)
$Y_{i,t-1}$	-0.037* (0.002)	-0.045* (0.002)	-0.066* (0.003)
$X_{i,t}$	-0.35* (0.110)	0.02 (0.130)	0.70* (0.170)
S.E.	0.039	0.038	0.037
# panel	2359	2359	2359
R ² adj	0.13	0.16	0.19

standard errors in parentheses
* indicates statistical significance at the 5% level

The catch up parameter, β_2 , unambiguously suggest convergence. Its estimate ranges from -0.037 under the assumption of absolute convergence, to -0.045 under the assumption of country-specific steady states, to -0.066 under the assumption of regional steady states. This means that lagging regions annually tend to bridge 3.7%, 4.5% and 6.6% of the gap between their present and steady state productivity.

The cohesion support parameter, β_3 , behaves more whimsically. Its estimate ranges from -0.35, to 0.02, to 0.70 under the respective assumptions. The first estimate -0.35 implies that if a stream cohesion support would be increased by 1% of regional GDP, the annual growth rate of GDP per capita of the recipient region would *decrease* by 0.35%-points. This is conceivable in case of excessive crowding out and rent seeking. The assumption of absolute convergence causes, however, a downward bias of the estimator if recipient regions tend to have a relatively low unexplained growth rate. The second estimate 0.02 is small and statistically insignificant. It

implies that cohesion support has no effect. The third estimate 0.7 suggests that a similar boost of cohesion support increases regional growth by 0.7%-points.

The pattern points at a clear trade-off: the more optimistic one is about convergence, the more pessimistic one should be about the effectiveness of cohesion support, and vice versa. To see this, recall that the assumption of absolute convergence corresponds, from the perspective of equality, to the *optimistic* view that poor regions will in the long run catch up with rich regions. The snag here is that the results suggest that cohesion support has a *negative* impact on economic growth. In contrast, the assumption of region-specific steady states corresponds to the *pessimistic* view that poor regions may never catch up. The results now suggest a significant *positive* impact of cohesion support on economic growth. To underline this trade off, the intermediate position of country-specific steady states yields no significant impact.

6 Conclusion

Cohesion policy should foster convergence between the European regions. The data show that a necessary condition for its effectivity is satisfied: it redistributes funds from rich to poor.

Evidence on the impact of cohesion support on regional economic growth is, however, mixed.

The estimated impact of cohesion policy on the economic growth of lagging regions is substantial if one presupposes that each region grows towards its own steady state level of GDP per capita. The estimated impact is, however, negligible or even negative if one presupposes that regions within one Member State, respectively within the EU, will converge to the same steady state level of GDP per capita. This clearly constitutes a trade-off. The more optimistic one is about convergence, the less effective cohesion policy appears to be, and vice versa. The somewhat grim conclusion must be: either cohesion policy is counterproductive, or regional differences will persist. One cannot have the best of both worlds. This does not, however, imply that one should do away with cohesion policy, or conversely increase the effort. It merely implies that one cannot be overly optimistic.

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