

Thomas, Ingo P.

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Regional Policy, Convergence and Subsidiarity
in the European Community

by

Ingo P. Thomas



Institut für Weltwirtschaft an der Universität Kiel
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Regional Policy, Convergence and Subsidiarity in the European Community

by Ingo P. Thomas

April 1996

JEL-Classification: H77, O52, R11

Abstract. The aim of this paper is to shed light on how real income has developed across the member states and regions of the EC and to consider what demands this will place on regional policy. According to the principle of subsidiarity, a necessary, though not a sufficient, condition for EC intervention would be to prove that the scale of regional problems is too great to be handled by member states. Using two concepts of convergence, it can be shown that income convergence across the member states and even across the regions of the EC is the norm. Based on the principle of subsidiarity, policy implications concerning the assignment of a complementary function for redistributive regional policy to the EC tier are derived from the empirical evidence.

1. Cohesion and Regional Policy in the EC

With the decision to progress towards a full and unified internal market in the 1986 Single European Act, the objective of economic and social cohesion across the EC was added to the Treaty of Rome. The Community also received an explicit competence for undertaking a regional policy based on the activities of the European Regional Fund, the European Social Fund, and the guidance section of the Agricultural Guarantee and Guidance Fund, jointly known as the structural funds. Since then, spending on regional policy more than doubled. According to the Medium-term Financial Perspective 1988-92, annual spending on regional policy increased from 7.8 billion ECU to 13.5 billion ECU. In the present Financial Perspective 1993-1999 more than 180 billion ECU are devoted to structural expenditures, primarily financed by the structural funds and by the new cohesion fund introduced at Maastricht in 1991. The greater part of structural spending is regionally-targeted. For the four cohesion fund member states Spain, Portugal, Ireland, and Greece – characterised by GDP per head of less than 90% of EC average – the allocations should permit a doubling of commitments for the so-called objective-1-regions (i.e. areas with GDP per head less than 75% of the Community average). Earmarked financial assistance for all objective-1-regions of the EC amounts to more than 96 billion ECU in 1994-1999 (without the new member states Austria, Finland, Sweden); 60 billion ECU are earmarked for the cohesion countries (COMMISSION, 1992, OFFICIAL JOURNAL OF THE EC, 1993, THOMAS, 1994).

Increasing concern about economic disparities can be attributed to a number of reasons. First of all, new members with below average social and economic endowments have been added to the Community in 1981 (Greece) and in 1986 (Spain and Portugal), making the Community much more heterogeneous with regard income levels. There may be some notion of solidarity to help the poor countries to catch up with the rich ones. Furthermore, the increase of structural funds and the decision to introduce the cohesion fund must be seen as integral part of the decision-making process in the EC. Every time the member states decide on important initiatives of European integration (entry of new members, monetary union), each country has a veto right which it can use to get side-payments for approving the EC initiative. Arguably, EC initiatives may create winners and losers. A pareto-improving initiative, therefore, might only be implemented if the winners compensate the losers using income transfers financed by the structural funds and the cohesion fund as side payments. Accordingly, cohesion is seen in terms of what is needed to sustain a willingness to remain part of the Community (BEGG and MAYES, 1993). This more political explanation for redistributive policies in the EC is related

to a third argument which is based on the implicit recognition that the original belief in an automatic process of spatially balanced growth supported by economic integration is outmoded. Instead, some sort of „market failure“ may encourage the concentration of economic activity. Income in rich central areas may still increase more than average and income in less-favoured peripheral regions may even decline. This may simply be based on increasing returns to scale internal to firms or it may come from the existence of technological externalities between firms. As this development could lead to inefficiencies – e.g. congestion externalities in central areas – or could damage political cohesion, it gives rise to a case for regional policy.

Although the objective of cohesion, as stated in Article 130a of the Single European Act and emphasised by the Maastricht treaty, takes up a prominent role in EC integration, the Community avoided to set any minimum requirements for interregional equity. The choice of cohesion as opposed to interregional equity is important, in that it is *growth* and not the *level* of regional income that is focused on (COSTELLO, 1993). If one accepts cohesion as a fundamental objective and a *conditio sine qua non* of European integration the question arises what role the Community should play in achieving cohesion. In other words, the problem of assigning policy competences in a federal context is raised.

In the further analysis, two related issues are addressed. The first one concerns the extent to which there is a problem of increasing regional disparities in the EC. The second issue concerns the assignment problem: If there is need for regional policy, what tier of government should be responsible for regional policy? To answer the second question, a point of reference is needed to determine the efficient allocation of powers in a federal structure. Therefore, we begin with developing a normative guide for assigning competences to levels of government (Section 2). The principle derived will be applied to the case of cohesion and regional policy. In Section 3 two concepts of convergence will be used to determine if the increase of regional disparities across the EC may constitute a community-wide regional problem, or if convergence is the norm for the regional economies of the EC. The first concept is based on cross-section data (β -convergence), the second one is based on the evolving dynamics of the cross-section distribution of income (σ -convergence). Thus, the empirical analysis is put on a broad basis. The empirical results will then be used to determine whether there is a role for the EC tier to pursue a redistributive regional policy (Section 4).

2. Subsidiarity and Cohesion in the EC

A normative guide for assigning competences in a federal structure is associated with the principle of subsidiarity. The principle of subsidiarity, which appears in Article 3b of the EC Treaty, articulates a presumption that the powers of EC institutions should be limited to those functions that can not be adequately performed by its member states. The relevant second sentence of Article 3b reads:

„In areas which do not fall within its exclusive competence, the Community shall take action, in accordance with the principle of subsidiarity, only if and in so far as the objectives of the proposed action can not be sufficiently achieved by the Member States and can therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community“.

But this formulation of the principle of subsidiarity is not an adequate guidance for an efficient distribution of power in the EC. It is vague, it is open to many interpretations and it is not explicit about the definition of exclusive competences. The Commission favours a wide interpretation by suggesting that the exclusive competences are those where the four freedoms (movements of goods, capital, services, and people) are involved. According to Article 3b, exclusive competences are not subject to the principle of subsidiarity. Therefore, many policy areas could be excluded from the application of the subsidiarity principle as long as they can be associated in some way with the implementation of the four freedoms. In this context, the principle of subsidiarity should be regarded more as the expression of a broad political principle than a clear guide to the allocation of power (CEPR, 1993). What is needed, however, is an explicit procedure for the allocation of competences and a further clarification of the principle of subsidiarity.

One possibility is the implementation of a subsidiarity test – as it is envisaged by the Council of Ministers and also proposed in the literature (COMMISSION, 1993, ADVISORY COUNCIL, 1994). Such a test would be based on the evaluation of the costs and benefits of centralisation versus decentralisation. The arguments about the costs and benefits are derived from the theory of fiscal federalism. With regard to efficiency considerations, the benefits of centralisation are primarily based on the existence of economies of scale (e.g. certain public goods cost much less if provided by the central government rather than by several separate jurisdictions) and on the existence of inter-jurisdictional externalities (e.g. public goods generating spillovers may be more efficiently provided by the central government rather than

by separate jurisdictions which do not take into account the spillovers generated). On equity grounds, centralisation might be a precondition for interpersonal redistribution, since redistributive taxation on a decentral level could be frustrated by the mobility of the richest and of the poorest of the citizens. Moreover, centralisation could be essential to facilitate redistribution between jurisdictions. Centralisation might increase the extent of interregional transfers, because it increases the ability of beneficiaries of interregional redistribution to put transfers into effect. All these advantages of centralisation are based on the notion that a coordinated policy is better than a policy undertaken independently by the jurisdictions. However, it leaves open the question why the necessary coordination is not achieved by agreements among the jurisdictions. In the recent literature, the true benefit of centralisation is therefore seen in the fact that it provides a more credible mechanism for achieving coordination than decentral agreements would on their own (CEPR, 1993). Under decentral coordination jurisdictions retain the right to pursue a policy as they wish; under centralisation they can be overruled. Accordingly, VAN ROMPUY et al. (1991, p. 111) state that „(...) failure to reach agreements between competitive lower level governments constitute the only motive to assign functions to a higher level in the hierarchy“.

With respect to the benefits of decentralisation, the main advantage lies in the regional differentiation of policies. As the central authority may be less well informed about the local conditions and about the effects of new policies or may be less informed about the local preferences than the local authorities, the central government tends to provide uniform policies not in accordance with the preferences of the people (OATES, 1972). Moreover, recent literature stresses the importance of political accountability as the fundamental advantage of decentralisation. Even if a central government would have the necessary information, the question arises why it should differentiate its policy according to the conditions and wishes of the people? Decentralisation allows citizens to express their dissatisfaction with the policy of their jurisdiction by moving to another jurisdiction (voting with the feet) or by deciding to replace their government (voice) (OPP, 1994). Centralisation limits the possibility of the individual citizen to express his or her political protest. Thus, decentralisation can be seen as a credible commitment of the politicians to differentiate their policies by locality to reflect the different conditions and preferences of those localities.

The trade-off between centralisation and decentralisation can be summarised as follows: Centralisation enables the benefits of policy coordination to be realised, but it incurs the costs

of loss of accountability to the needs and interests of differing jurisdictions. Decentralisation allows for the benefits of differentiation, but it generates costs through the non-cooperative behaviour of local governments. Given the ambiguities and uncertainties in evaluating the benefits and costs, the principle of subsidiarity presumes that in case of doubt the potential costs of government failure on a decentral level are judged to be lower than those on a central level. Public decisions, therefore, should be left to the lowest government level possible unless there are „good reasons“ for centralisation. Put alternatively, the assignment of power to a higher level requires that such a step would lead to a *significant* increase in welfare. The priority of decentralisation incorporated in the principle of subsidiarity implies that the burden of proof lies with the proponents of centralisation. The proponents of centralisation must prove from case to case what exactly might constitute good reasons for overriding the presumption of decentralisation.

How does the principle of subsidiarity relate to objective of cohesion in the EC? First of all, reducing regional disparities should be a national task. If regional income convergence is not induced by the market process, each member state has to decide on the extent to which regional imbalances are to be reduced within its own boundaries. This decision has to be based on the country-specific evaluation of the benefits and costs of regional policy. With regard EC regional policy, the relevant question then is: What are the conditions which would require coordinated action at the supranational level? According to the principle of subsidiarity, centralisation may be justified if evidence is provided that regional income convergence can not be sufficiently achieved by the member states and can be better achieved by the Community. This could be the case if regional disparities in the EC attain an order of magnitude national governments are no longer able to cope with. This would be a necessary condition, though not a sufficient one, for any supranational involvement based on the objective of cohesion. In the following section it is analysed, whether the increase or persistence of regional disparities in the EC constitute a community-wide problem. This will allow to evaluate whether income convergence is the norm or whether there is any indication that the scale of regional problems in the EC is too great to be handled by the national governments.

3. Convergence and Divergence in the EC – The empirical evidence

Even without sophisticated empirical analysis, it can be easily established that there is a regional problem in the EC. For this, we compare the income position of the poorest and richest regions relative to the weighted average income of all regions in 1981 and 1992. The results are presented in Table 1 for the 25 poorest regions and in Table 2 for the 25 richest regions. GDP per head measured in purchasing power standards is provided by the REGIO database of the Statistical Office of the European Communities (EUROSTAT) on four levels of territorial aggregation. For our analysis, we use the income data for the 12 old member states (without the new members Austria, Finland, and Sweden) on the national level and on level II of the regional classification system NUTS (Nomenclature of Territorial Units for Statistics) of EUROSTAT. The NUTS II level is of special interest since most of the regional transfers financed by the structural funds are directed to the poorest regions defined on this territorial aggregation level.

Table 1: The 25 poorest NUTS II regions in 1981 and 1992

Region (NUTS II)	GDP/Head ¹ relative to the weighted EC average 1981	Region (NUTS II)	GDP/Head ¹ relative to the weighted EC average 1992
393 Calabria	0,630157	392 Basilicata	0,650292
8 Ireland	0,609314	393 Calabria	0,61158
A11 Anatoliki, Makedonia	0,55126	A11 Anatoliki, Makedonia	0,548796
A12 Kentriki, Makedonia	0,60535	A12 Kentriki, Makedonia	0,576342
A13 Dytiki, Makedonia	0,585657	A13 Dytiki, Makedonia	0,587323
A14 Thessalia	0,604455	A14 Thessalia	0,542344
A21 Ipeiros	0,489625	A21 Ipeiros	0,454807
A22 Ionia Nisia	0,552538	A22 Ionia Nisia	0,520817
A23 Dytiki Ellada	0,567883	A23 Dytiki Ellada	0,509001
A3 Attiki	0,659056	A25 Peloponnisos	0,5921
A41 Voreio Aigaio	0,443847	A3 Attiki	0,666856
A42 Notio Aigaio	0,597038	A41 Voreio Aigaio	0,438367
A43 Kriti	0,540518	A42 Notio Aigaio	0,584593
B11 Galicia	0,605222	A43 Kriti	0,535024
B41 Castilla-Leon	0,665578	B11 Galicia	0,572743
B42 Castilla-La Mancha	0,574916	B41 Castilla-Leon	0,646818
B43 Extremadura	0,441801	B42 Castilla-La Mancha	0,633417
B61 Andaluca	0,540902	B43 Extremadura	0,497428
B62 Murcia	0,621078	B61 Andaluca	0,576156
B63 Ceuta Y Melilla	0,479651	B62 Murcia	0,680195
B7 Canarias	0,60356	B63 Ceuta Y Melilla	0,600971
C11 Norte	0,50676	C11 Norte	0,584779
C12 Centro	0,477477	C12 Centro	0,467525
C14 Alentejo	0,47249	C14 Alentejo	0,397297
C15 Algarve	0,557014	C15 Algarve	0,562445

¹in Purchasing Power Standards The relative „losers“ are shaded

Table 1 shows that most of the 25 poorest regions on NUTS II level in 1981 were even poorer in 1992. According to Table 2, most of the 25 richest regions improved their income position relative to the weighted average income in the EC. To a certain extent, therefore, regional disparities in the EC have increased during the eighties.

Table 2: The 25 richest NUTS II regions in 1981 and 1992

Region (NUTS II)	GDP/Head ¹ relative to the weighted EC average 1981	Region (NUTS II)	GDP/Head ¹ relative to the weighted EC average 1992
12 Hamburg	1,873848	12 Hamburg	1,914335
14 Bremen	1,583321	13B Hannover	1,172784
151 Düsseldorf	1,280774	14 Bremen	1,510214
152 Köln	1,157505	151 Düsseldorf	1,212489
16A Darmstadt	1,456343	16A Darmstadt	1,699432
173 Rheinhessen-Pfalz	1,158144	181 Stuttgart	1,426151
181 Stuttgart	1,378725	182 Karlsruhe	1,26243
182 Karlsruhe	1,259036	184 Tübingen	1,163478
191 Oberbayern	1,38921	191 Oberbayern	1,535526
195 Mittelfranken	1,21428	195 Mittelfranken	1,261065
1B Berlin	1,280263	21 Ile de France	1,650484
21 Ile de France	1,633831	312 Valle D' Aosta	1,262182
242 Alsace	1,173233	313 Liguria	1,180415
311 Piemonte	1,199703	32 Lombardia	1,309208
312 Valle D' Aosta	1,300466	331 Trentino-Alto Adige	1,211744
32 Lombardia	1,341897	333 Friuli-Venezia Giulia	1,194063
331 Trentino-Alto Adige	1,192158	34 Emilia-Romagna	1,251201
333 Friuli-Venezia Giulia	1,153157	36 Lazio	1,170551
34 Emilia-Romagna	1,346629	411 Groningen	1,291961
411 Groningen	2,328436	502 Brabant	1,189348
472 Noord-Holland	1,21249	511 Antwerpen	1,277754
502 Brabant	1,213641	53 Brussel	1,695834
511 Antwerpen	1,267603	6 Luxembourg (Grand-Duche)	1,524917
53 Brüssel	1,703905	755 Greater London	1,393829
755 Greater London	1,422969	7A4 Grampian	1,304989

¹in Purchasing Power Standards The relative „winners“ are shaded

Assuming that regions have similar technologies and preferences, the traditional neoclassical growth model with diminishing returns predicts that income per head should converge over time towards the same steady-state. Even if regions have different parameters of preferences and technology, poor regions tend to grow faster to their steady-state income level than the richer regions to their higher steady-state income level. Thus, if we control for various differing characteristics across regions, the data should show a process of *conditional* convergence (BARRO and SALA-I-MARTIN, 1995). Other predictions are derived by the new growth models which assume non-convexities in production or some externalities arising from the process of factor accumulation. In these models, regional income per head can diverge. This is emphasised by agglomeration economics which can lead to a core-periphery pattern of regional

economic activity (KRUGMAN, 1991). In this context, the free flow of goods and factors may accelerate divergence (GROSSMAN and HELPMAN, 1991).

The development of regional income presented in Tables 1 and 2 seems to support the core-periphery conceptualisation of increasing regional disparities. It is quite obvious that most of the relative „losers“ in Table 1 belong to the regional periphery of the EC and most of the relative „winners“ in Table 1 are also the economic centres of their countries. Accordingly, we do not expect that the regions in Table 1 and 2 have the same steady-state path. But – according to our understanding of subsidiarity and cohesion – what we are interested in is not the fact that some poor regions have grown slower and some rich regions have grown faster than the EC average. The principle of subsidiarity implies that it is first of all convergence on the national level which matters. Considering the objective of cohesion, income convergence across the member states would be an indication that national governments, on principle, should have the capacity to handle their regional problems and, thus, to achieve cohesion, especially if even on the regional level the vast majority of regions disclose a tendency to income convergence. Therefore, we want to find out whether convergence on the national and – to a certain extent – even on the regional level is the norm.

The more detailed empirical analysis is based on two concepts of income convergence. The first concept is used by BARRO and SALA-I-MARTIN (1995) to analyse if – on average – a poor economy tends to grow faster than a rich one. Based on a simple neoclassical model of growth, BARRO and SALA-I-MARTIN show that the transition process of income per capita $y_{i,t-T}$ in region i at time $t-T$ over the period T can be approximated as

$$(1) \quad \frac{1}{T} \log \left[\frac{y_{i,t}}{y_{i,t-T}} \right] = g + \frac{1 - e^{-\beta T}}{T} \log \left[\frac{\tilde{y}_i^*}{\tilde{y}_{i,t-T}} \right]$$

where g is the steady-state growth rate, $\tilde{y}_{i,t-T}$ is the income per worker adjusted for technological progress, and \tilde{y}_i^* is the steady-state level of output per worker adjusted for technological progress. The coefficient β determines the speed of adjustment to the steady-state. The higher β the greater is the responsiveness of the average growth rate (left hand side of equation (1)) to the gap between $\log(\tilde{y}_i^*)$ and $\log(\tilde{y}_{i,t-T})$. The value β can be used to calculate the half-life-period. This is the time h that it would take for the economy to go half

the distance between any initial level and its steady-state level: $h = -\ln(0.5/\beta)$.¹ The concept of β -convergence implies conditional convergence in that for given g and \tilde{y}_i^* the growth rate is higher the lower $y_{i,T}$. In order to identify β it is therefore necessary to hold fixed the regional differences in steady-state values. The second concept we use is called σ -convergence. According to this concept, convergence involves a decline of regional income dispersion. Dispersion is usually measured by the standard deviation of the logarithm of per capita income across a group of countries or regions (COMMISSION, 1987).

In the following empirical analysis, we use both concepts to test for the convergence hypothesis. The concept of β -convergence, as used by BARRO and SALA-I-MARTIN, plays a prominent role in the current debate on the empirical evidence of income convergence. Since this concept only applies to average data in a cross-section analysis, it neglects time trend information. This critique justifies the use of the second criteria for income convergence (σ -convergence) which makes use of annual income information.

a. The concept of β -convergence

Figures for Gross Domestic Product (GDP) per head in purchasing power parities are taken from REGIO. On the national level, data for the 12 old member states is provided for the time period 1975-1992. For the empirical analysis on the NUTS II level, the five East German Länder, the French overseas departments, Corse, Azores, and Madeira are excluded. Additionally, the regions of Groningen and Berlin are omitted because of a statistical artefact which would bias the analysis towards convergence.² For the remaining 164 NUTS II regions, the income data covers the period 1980-1992. The only exception are the regions of the UK

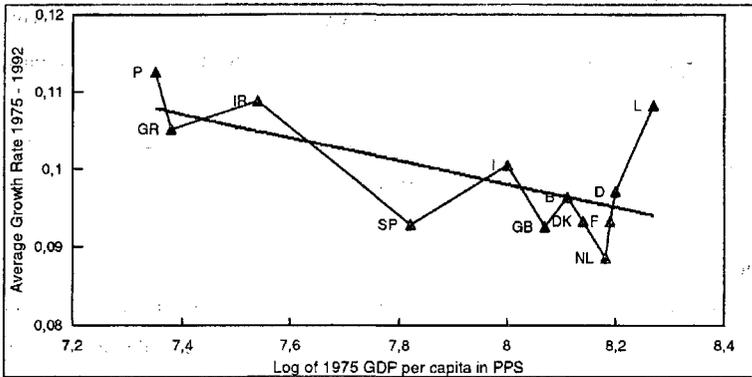
¹ A crucial element for convergence in the neoclassical model is diminishing returns to capital. To assess the relation quantitatively, BARRO and SALA-I-MARTIN (1992) use a set of baseline values for the other growth determining parameters of the model and assume different values for the capital share coefficient α of the production function. Assuming $\alpha=0.35$ implies $\beta=0.126$ per year, corresponding to a half-life-period of 5.5 years. For $\alpha=0.8$, which would apply if capital is interpreted broadly to include human capital, the value $\beta=0.026$ per year implies a half-life-period of 27 years. Most empirical studies based on equation (2) yield β -values in the range of 1% up to 2% (for the US states, or some groups of countries or regions of the EC, and of the OECD respectively) which would imply production coefficients of more than 0.8 (BARRO and SALA-I-MARTIN, 1992, 1995, MANKIW et al., 1992, NEVEN and GOUYETTE, 1994).

² Total gas production of the Netherlands from the North Sea is attributed to Groningen. When gas prices fell in the eighties, the income of Groningen – which was the richest region in 1981 – declined dramatically. Likewise, the inclusion of East-Berlin to the region of Berlin led to an artificial drop of income in the early nineties.

for which no figures are given for the years 1980, 1982, 1983, 1985, 1986. The regression based on equation (1), therefore, is run on initial income in 1981.

The relationship between the initial income per capita (in log) and average growth rate on the national level is depicted in figure 1. Obviously, there is a negative correlation between initial income and the average growth rate as it is predicted by neoclassical growth theory. Only Luxembourg must be considered as a significant outlier.

Figure 1: β -convergence on the national level



To get a more precise idea of the characteristics of the convergence process across the member states, a regression based on nonlinear least squares is run as proposed by BARRO and SALA-I-MARTIN. Therefore, equation (1) must be slightly modified. Because it is difficult to control for technological progress, the differences in $\tilde{y}_{i,t-T}$ and $y_{i,t-T}$ are ignored. Equation (1) then becomes

$$(2) \quad \frac{1}{T} \log \left[\frac{y_{i,t}}{y_{i,t-T}} \right] = a - \frac{1 - e^{-\beta T}}{T} \log [y_{i,t-T}] + u_i$$

where u_i represents the normally distributed error term and the intercept is $a = g + \frac{1 - e^{-\beta T}}{T} \log [y_i^*]$. Thus, the coefficient on initial income $y_{i,t-T}$ is $(1 - e^{-\beta T})/T$. The estimate of β can be obtained for different intervals T . In the simplest case, we do not distinguish between absolute and conditional convergence across the member states of the EC. This would imply that all countries follow the same growth path. This could be justified on the ground that the Common Market allows for rapid technological diffusion. Therefore, national differences in

technology can be neglected. Otherwise, conditioning variables must be introduced (i.e. split up the constant a) to account for international differences in steady-state income. The conditioning variables hold constant the determinants of the steady-state value in order to isolate the predicted inverse relationship between growth rates and initial positions. Therefore, the conditioning variables explain the permanent growth component or trend, and the initial condition controls for transitory dynamics.

Table 3 contains the β -estimates for the time interval 1975-1992 and for three subperiods 1980-92, 1980-86 and 1986-1992. Also, the significance level (in parenthesis) and the centred R^2 is reported. The estimates in the shaded cells are significant at the 5% level.

Table 3: β -convergence on the national level

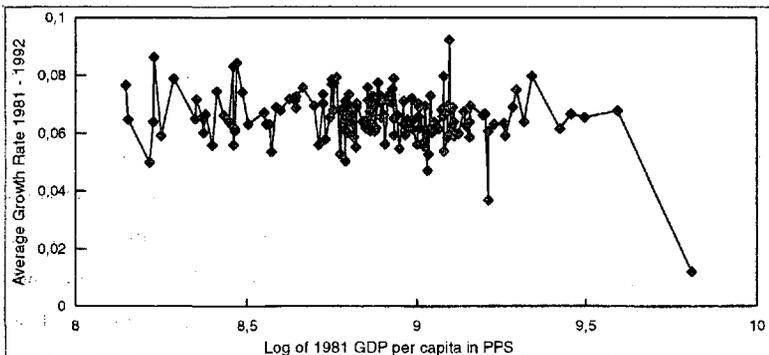
	1975-1992	1980-1992	1980-1986	1986-1992
Unconditional	$\beta = 0,0175$ (0,046) $R^2 = 0,41$	$\beta = 0,0082$ (0,48) $R^2 = 0,055$	$\beta = -0,009$ (0,388) $R^2 = 0,07$	$\beta = 0,0217$ (0,15) $R^2 = 0,213$
Share of employees in industry 1981	$\beta = 0,0217$ (0,024) $R^2 = 0,55$	$\beta = 0,0139$ (0,29) $R^2 = 0,2$	$\beta = -0,008$ (0,53) $R^2 = 0,09$	$\beta = 0,0305$ (0,07) $R^2 = 0,39$
Dummy Luxembourg	$\beta = 0,024$ (0,0028) $R^2 = 0,77$	$\beta = 0,0174$ (0,054) ¹ $R^2 = 0,69$	$\beta = -0,0015$ (0,85) $R^2 = 0,652$	$\beta = 0,0364$ (0,0258) $R^2 = 0,55$
Each cell contains the estimate of β , the significance level of this estimate (in parenthesis), and R^2 of the regression. The estimates in the shaded cells are significant at the 5% level; ¹ significant at the 10% level				

According to the unconditional model, the convergence rate for the time period 1975-92 is 1.75% per year. This means that each year the gap between actual income and the steady-state income has decreased by 1.75%. The half-life-period is 39.6 years. If we introduce as a conditioning variable the share of employees in industry in 1981 to account for differences in the industrial structure the β -estimate is 2.17% ($h=32$). This variable may also capture the effect of aggregate shocks (e.g. oil price shock) if these shocks had effects in the same direction on the incomes of industrial regions relative to the incomes of other regions.³ If we

³ The cross-sectional dispersion of income is sensitive to shocks that have a common influence on different subgroups of regions. Therefore, the condition that u_i in equation (2) is independent of u_j for $i \neq j$ is violated. To the extent that the shocks are correlated with the explanatory variable, the omission of such shocks from the regression will tend to bias the estimates of β (BARRO and SALA-I-MARTIN, 1995).

take into account that Luxembourg is an outlier and may be characterised by a different „technology“, introducing a dummy-variable for Luxembourg yields a β -rate of 2.4% ($h=29$). Thus, the β -values estimated based on the unconditional model and on the (slightly) conditioned models are higher than the β -rates BARRO and SALA-I-MARTIN estimated for the US states for the periods 1970-80 ($\beta=1.98\%$) and 1980-90 ($\beta=1.11\%$).⁴ But the β -values turn out to be instable if we look at the estimates for the subperiods. In particular, the estimated rates are much smaller and insignificant at the 5% level for the somewhat shorter subperiod 1980-92. In the subperiod 1980-86, there was no convergence at all. By contrast, the estimates for the subperiod 1986-92 indicate convergence, especially when the Luxembourg-Dummy is introduced. This instability is an indication that the overall convergence process in the time interval 1975-1992 is influenced by (country-specific) shocks. One explanation could be that the fundamental economic conditions during the eighties changed significantly. A cautionary interpretation might suggest an association of the lack of cross-country convergence during the first half of the eighties with the unfavourable economic conditions, marked by the second oil price shock and the worldwide recession, and of the acceleration of convergence during the second half of the eighties with the liberalisation shock (entry of Spain and Portugal into the EC, implementation of the Common Market project laid down by the Single European Act) and with economic stability over that period.

Figure 2: β -convergence on NUTS II level (164 regions)



4. It might be argued that convergence analysis could be distorted by EC income transfers. But EC financial assistance was relatively small during the eighties; a significant increase happened not until the early nineties. Therefore, the overall impact of EC income transfers is negligible.

We would also expect to observe this instability of the spatial growth pattern on the regional level. If we look at the correlation between initial income in 1981 and the average growth rate in 1981-92 depicted in figure 2 for the regional level, we can not identify any convergence process. Accordingly, the estimated β -rate in the unconditional model (version 1) reported in Table 4 turns out to be insignificant. Only for the subperiods 1981-89 ($\beta=0.64\%$) and 1986-92 ($\beta=0.7\%$) very low convergence rates were estimated.

According to theory, we do expect agglomeration economies to become more pronounced the more disaggregated the regional level (DUNFORD, 1993). We have already seen that – to a certain extent – regional development in the EC is characterised by a core-periphery pattern (Table 1 and 2). The persistence of regional problems may be attributed to cumulative effects of region-specific advantages or disadvantages which might be relevant especially for the regions of the lower or upper end of the income range. Therefore, we are interested to analyse if there is convergence even on the regional level if we take into account that especially some poor regions are expected to become poorer and some rich ones richer. Put it differently: Is there any indication for interregional convergence as a norm if the model is conditioned for the very poorest and very richest regions? Then, the problem of increasing regional disparities should be of limited relevance.

Under the assumption that a higher-than-average percentage of poor regions are provided with unfavourable growth conditions (e.g. peripheral location), we introduce a Lower-Club-Dummy for the 25 poorest regions in 1981. Likewise, an Upper-Club-Dummy for the 25 richest regions in 1981 is defined, assuming that most of those regions have a specific advantage (e.g. because of scale effects) over other regions (version 2).⁵ In this model, the estimated β -values are 1.3% for the interval 1981-92 ($h=53.3$) and even 2 % for the subperiod 1981-89 ($h=34.6$).⁶ As on

⁵ This numerical limitation of the Lower- and Upper-Club is – to a certain extent – arbitrary. Nevertheless, it can be justified on two grounds. First, it is used by the EC-Commission to illustrate the significance of regional disparities (COMMISSION, 1987, 1994). Second, it can be shown that a much smaller limitation (e.g. 10) would not alter the estimates significantly compared to the unconditional model; a much larger one would make it harder to determine any systematic development. The last argument also holds if we would condition the model using a variety of structural variables. From a political point of view, it is first of all absolute, not conditional, convergence which matters. Therefore, we prefer to estimate the convergence-rates for different groups or subgroups of countries and regions based on an (otherwise) unconditioned model.

⁶ Inclusion of the industry variable had almost no impact on the estimated β -values.

the national level, convergence in the early eighties was slower (1.4% and significant at the 10% level) than in the interval 1986-92 (1.65%). This seems to support the hypothesis that market liberalisation had a positive impact on convergence. Interestingly, the estimated convergence rates are higher in 1981-86 and lower in 1986-92 if country dummies are introduced. The country dummies are proxies for differences in the steady-state values and for countrywide fixed effects in the error term. Therefore, the empirical results do indicate that the bad convergence performance (without country dummies) in the first subperiod might be attributed to country specific effects.

Table 4: β -convergence on NUTS II level⁷

	1981-1992	1981-1989	1981-1986	1986-1992
Unconditional: 164 Regions	$\beta = 0,003$ (0,16) $R^2 = 0,012$	$\beta = 0,0064$ (0,03) $R^2 = 0,03$	$\beta = -0,0016$ (0,65) $R^2 = 0,0016$	$\beta = 0,007$ (0,013) $R^2 = 0,05$
Lower/Upper Club'81 with Industry 1981	$\beta = 0,013$ (0,0004) $R^2 = 0,07$	$\beta = 0,02$ (0,001) $R^2 = 0,1$	$\beta = 0,014$ (0,067) ¹ $R^2 = 0,06$	$\beta = 0,016$ (0,0079) $R^2 = 0,07$
Lower/Upper- Club'81 with country dummies	$\beta = 0,009$ (0,038) $R^2 = 0,34$	$\beta = 0,013$ (0,03) $R^2 = 0,35$	$\beta = 0,023$ (0,007) $R^2 = 0,3$	$\beta = 0,0034$ (0,53) $R^2 = 0,49$
Unconditional/ without Greece, Luxembourg: 150 Regions	$\beta = 0,0077$ (0,0014) $R^2 = 0,072$	$\beta = 0,011$ (0,0008) $R^2 = 0,078$	$\beta = 0,00005$ (0,99) $R^2 = 0,000001$	$\beta = 0,015$ (0,000009) $R^2 = 0,173$
Unconditional/ without cohesion countries: 127 Regions	$\beta = 0,0038$ (0,22) $R^2 = 0,012$	$\beta = 0,0125$ (0,07) ¹ $R^2 = 0,062$	$\beta = 0,0017$ (0,7) $R^2 = 0,0015$	$\beta = 0,0009$ (0,82) $R^2 = 0,00055$
Each cell contains the estimate of β , the significance level of this estimate (in parenthesis) and R^2 of the regression. The estimates in the shaded cells are significant at the 5% level; ¹ significant at the 10% level				

Recalling Table 1, it may be seen that the Greek regions are highly represented in the Lower-Club. To evaluate their impact on interregional convergence in the EC, the Greek regions and the outlier Luxembourg are omitted from the sample (version 3).⁸ With the exception of the subperiod 1981-86, all β -estimates are significant and lie in the range of 1%. If the regions of

⁷ Regressions for the subperiods 1981-86 and 1986-92 only used 129 regions because income figures for the UK are no available on REGIO for 1986.

⁸ On the regional level, inclusion of Luxembourg had almost no effect on the β -estimates.

the four cohesion countries (Spain, Portugal, Greece, and Ireland) are dropped (version 4), interregional convergence across the remaining regions is almost non-existent (with the exception of 1981-89). This indicates that convergence found in version 2 and 3 can be explained primarily by the regions of Spain and Portugal and of Ireland catching up with the regions of the richer member states.

Convergence analysis à la BARRO and SALA-I-MARTIN is controversial. One major point of critique is that β -analysis implicitly assumes that every economy has a steady-state growth path, well-approximated by a time trend. Such an approach might be adequate if permanent moves in income were well-described by smooth time trends. Put alternatively, the smooth time-trends approximation is good only when a large economic shock occurred at the beginning of the sample (QUAH, 1993). The significant instability of the estimated β -values with regard the underlying subperiods suggests that income development in the EC can not be described as a smooth trend. Accordingly, the average growth rate approach – even if informative – could be inadequate to analyse convergence in the EC. Therefore, we use another methodology to test for convergence which examines directly the evolving dynamics of the cross-section distribution of income.

b. The development of regional disparities: The concept of σ -convergence

The methodology is based on the concept of σ -convergence. It is analysed whether the dispersion of income across groups of economies tends to fall over time.⁹ Following BENDAVID (1993, 1994), interregional convergence is tested by pooling each country's or region's annual discrepancy from the group average and estimating the following equation:

$$(3) \quad y_{it} - y'_t = \theta(y_{it-1} - y'_{t-1})$$

where y_{it} is the log of the economy i 's per capita income in year t and y'_t is the average per capita income of the group in year t . Income disparity is then defined as the difference between economy i 's income and the group's average income. The parameter θ may be considered as the convergence coefficient. If $\theta < 1$, income disparity decreased. Dividing the $\log 0.5$ by $\log \theta$

⁹ A positive β -value does not imply a falling variance σ^2 . Over time, σ^2 falls (or rises) if the initial value σ_0^2 is greater than (or less than) the steady-state value σ^2 (σ -convergence). Thus, β -convergence is a necessary but not a sufficient condition for σ -convergence (BARRO and SALA-I-MARTIN, 1995).

yields the number of years required to halve the average disparity of the group.¹⁰ On the other hand, $\theta > 1$ indicates income divergence and $\log 2 / \log \theta$ gives the number of years it will take the average discrepancy to double. A rough estimate of the average annual rate of convergence is $0.5 \log \theta / \log 0.5$ (BÉN-DAVID, 1994).

To estimate θ , the following equation is used:

$$(4) \quad y_{it} - y'_{it} = a + \theta(y_{it-1} - y'_{it-1}) + \varepsilon_i.$$

The estimates for groups of member states are reported in Table 5 for time intervals 1975-92 and 1980-92. Besides the θ -values, the significance level (in parenthesis) and the number of observations (#) taken into account are documented. The calculated half-life-periods and convergence rates are reported in an extra column.

Table 5: θ -estimates on the national level with regard the respective group average

	1975-1992	Half-life-period Convergence-rate	1980-1992	Half-life-period Convergence-rate
All member countries	$\theta = 0,98$ (0,00745) # 200	34,3 0,0146	$\theta = 0,996$ (0,53) # 144	172,9 0,0029
Without Luxembourg	$\theta = 0,972$ (0,00037) # 183	24,4 0,0205	$\theta = 0,985$ (0,01) # 132	45,8 0,0109
Without Luxembourg and Greece	$\theta = 0,973$ (0,00022) # 166	25,3 0,0197	$\theta = 0,977$ (0,00035) # 120	29,8 0,0167
The cells on the respective left hand side contain the θ -estimates, the significance level concerning the null-hypothesis $H_0: \theta < 1$ and the number of observations # used. The estimates in the shaded cells are significant at the 5% level.				

Estimation of equation (4) for the 12 member states of the EC for the 1975-92 period yields an estimated θ of 0.98, indicating convergence. This corresponds to a half-life-period of 34 years and implies an average convergence rate of 1.46% p.a. Without Luxembourg, the θ -value is significantly smaller ($\theta=0.972$) and the half-life-period is 24 years. For the subperiod 1980-92, the estimation yields a θ -value not significantly different from 1. Thus, the no-convergence

¹⁰ Let $z_t = y_t - y'_t$. According to equation (3), $z_{t+1} = \theta z_t$ and therefore $z_{t+h} = \theta^h z_t$. Let $z_{t+h} = 0,5 z_t$ with h the number of years that it takes to reduce the average discrepancy in half. Then one gets: $0,5 z_t = \theta^h z_t$. Taking log and dividing by $\log \theta$ yields the half-life-period $h = \log 0,5 / \log \theta$.

hypothesis can not be rejected. Without Luxembourg, θ is significantly smaller than 1, again indicating convergence. If we also omit Greece, convergence for the 1980-92 interval becomes more pronounced ($\theta=0.977$), indicating that the slowing down of the convergence-trend compared to the period 1975-92 can be attributed to Greece.

Table 6: θ -estimates on the regional level with regard the respective group average

	1980-1992	Half-life-period Convergence-rate	1986-1992	Half-life-period Convergence-rate
All Regions (164 regions)	$\theta = 0,993$ (0,0067) # 1725	98,6 0,005	$\theta = 0,998$ (0,73) # 793	346,2 0,0014
Without Luxembourg and Greece (150 regions)	$\theta = 0,992$ (0,0047) # 1557	86,3 0,0057	$\theta = 0,9977$ (0,64) # 716	301 0,00166
Without Cohesion countries (127 regions)	$\theta = 1,0006$ (0,85) # 1281	-1155,6 -0,00043	$\theta = 1,004$ (0,3) # 587	-173,6 -0,0029
Without Lower/Upper- Club '81 (114 regions)	$\theta = 0,982$ (0,00018) # 1192	38,1 0,0131	$\theta = 0,973$ (0,00007) # 636	25,3 0,0197
The cells on the respective left hand side contain the θ -estimates, the significance level concerning the null-hypothesis $H_0: \theta < 1$, and the number of observations # used. The estimates in the shaded cells are significant at the 5% level.				

Table 6 contains the results for the NUTS II regions. Considering all 164 regions, the estimated θ is 0.993, indicating very slow convergence for the 1980-92 period. Dropping the Greek regions and Luxembourg yields still a relatively high θ -value of 0.992 which corresponds to a half-life-period of 86 years and an average convergence rate of 0.57% each year. Estimation of equation (4) without the regions of the cohesion countries yields $\theta=1.0006$, indicating that there was no convergence at all across the regions of the richer countries. If we estimate the θ -values for the subperiod 1986-92 we must reject the convergence thesis even for the group of regions without Greek and Luxembourg. This picture changes when the Lower- and Upper-Club regions are omitted. Then, the estimated θ is 0.982 for the 1980-92 interval with a half-life-period of 38 years. For the subperiod 1986-92, θ is even smaller. This is an indication that convergence across the vast majority of regions in the EC even accelerated in the second half of the eighties. Moreover, there is a positive correlation between liberalisation and convergence. On average, especially the regions of Spain, Portugal and Ireland were able to catch up with the regions in the non-cohesion countries. This is supported

by the fact that the estimated θ -values across all regions (without Greece and Luxembourg) are significantly lower than for the regions of the non-cohesion countries.

Compared to the estimates of the β -analysis, the estimated convergence rates are usually smaller, indicating that growth and convergence in the EC is not a smooth process but influenced by aggregate shocks. This is not adequately reflected in cross-section analysis using only point estimates. Thus, σ -analysis is more sensitive to changes of the underlying data set.¹¹ In general, the estimates based on the concept of σ -analysis support the results of the β -analysis in the preceding section.

4. Regional Policy and Subsidiarity in the EC – Summary and Policy Conclusions

The results of the cross-section analysis based on the concept of β -convergence as well as the analysis based on the concept of σ -convergence indicate that income convergence is the norm for the member states and regions of the EC. Convergence on the national level is absolute because it applies when no explanatory variable other than initial income is held constant. Convergence in the second half of the eighties is higher than in the early eighties, indicating that the liberalisation shock in 1986 did not harm convergence as is sometimes argued in the literature (O'DONNELL, 1992, BEGG and MAYES, 1993, PRUD'HOMME, 1993). On the regional level, absolute convergence is almost non-existent. However, convergence can be considered as the norm when the model is conditioned for the 25 poorest and 25 richest regions. Then, the estimated convergence rates amount to 1.3% p.a. for the interval 1981-92 which is lower than the convergence rate of 1.74% for the same period on the national level (with a dummy for Luxembourg). Moreover, convergence is more pronounced in the late eighties than in the interval 1980-86.

¹¹ According to EUROSTAT, income data in purchasing power parities has been revised in 1990 resulting in an artificial increase of the standard deviation of income in 1989/1990. As a consequence, the estimates are biased towards income divergence. To compensate for this effect, a slightly modified regression was run. When regressing the income difference in 1990 on the difference in 1989, a dummy-variable is multiplied with the income difference in 1989 allowing for the artificial increase of the standard deviation; thus, the θ -value was made variable. For the observations 91/90 and 92/91 dummies are introduced to make the constant a variable to take into account the effects of the data revision. As expected, the estimated θ -values are lower: For all regions, the θ -value is 0.989 with a half-life-period of 62 years. Without the Club-regions, estimation yields $\theta=0.965$ corresponding to half-life-period of about 20 years.

What are the implications for regional policy in the EC? According to the principle of subsidiarity, the governments of the member states should be responsible for regional policy. A supranational competence can only be justified if the proponents of centralisation provide evidence that a central co-responsibility would lead to a significant improvement of welfare. A necessary, though not a sufficient, condition would be to prove that without community interference regional disparities tend to increase on a large scale. Put alternatively, involvement of the EC tier should be restricted to cases where either the scale of the problem is too great or the fiscal capacity of the competent authority is too limited. Based on the empirical evidence, no point can be made for the presumption that without EC financial assistance cohesion would be threatened. First of all, the principle of subsidiarity implies that it is convergence on the national level which matters. During the last two decades, the speed of absolute income convergence across the member states of the EC has been in the range of the speed of income convergence across the US states although the American system of fiscal federalism is much more developed than the European one. On average, the poorer countries of the EC have grown faster than the richer member countries. Across the latter group, convergence is almost non-existent, but this should not constitute a major problem for cohesion in the EC. On the regional level, the vast majority of regions disclose a tendency to income convergence. Persistence of regional disparities, therefore, can not be considered as a problem of large scale within the EC; the national governments should be able, on principle, to manage their regional problems. Even if most of the least-favoured regions are located in the cohesion countries, the overall regional growth performance of the Spanish and Portuguese regions and of Ireland suggests that those countries belong to the relative winners of European integration. The only exception are the Greek regions. Almost all Greek regions have fallen behind. In the case of Greece it must be noticed that the relative income position of most Greek regions deteriorated *although* they were supported by generous funds from the EC in the late eighties and early nineties. Furthermore, the Greek government never implemented liberalisation policies in the same way as Portugal and Spain did when they entered the Community. As a consequence, most economists see the poor Greek performance primarily as the result of bad economic policy and mismanagement than of insufficient national resources (HALLET, 1995). Therefore, community transfers do cure the symptoms but do not provide the necessary stimulus for sustainable growth. Especially in the case of Greece, Community intervention should make sure that technical assistance is available to improve the administrative capacity in problem regions and to remedy over-restrictive regulations.

All things considered, the subsidiarity test fails to prove the necessity of a community-wide transfer scheme. There is no evidence that „market failure“ inherent in the process of European integration has aggravated regional disparities on a large scale. The priority of decentralisation incorporated in the principle of subsidiarity demands that centralisation can only be justified if evidence is provided that EC regional policy would lead to a *significant* increase of welfare for the whole Community. Given the empirical evidence, it can not convincingly be argued that the potential benefits of a coordinated solution of the EC tier outweigh the social costs of potential central government failure. Therefore, the assignment of a complementary function for redistributive regional policy to the EC is not justified.

A certain extent of inter-EC redistribution may be nonetheless unavoidable as an expression of solidarity or as the consequence of the decision-making process in the EC. If this holds, community-wide regional policy will be – by definition – based on a consensus of the member states. According to the principle of subsidiarity, this in turn implies that all important decisions on redistributive interventions should be left to the decentral bargaining process. In other words, the decisions on the size of the redistributive budget and on the way of financing it should be made unanimously. Any attempt to implement a system of automatic income transfers from richer to poorer regions or to introduce an EC tax for redistributive purposes should be rejected. That does not mean that there is no role for any central coordination at all. There may be good reasons to coordinate redistributive policies on a central tier, especially when conditional matching grants are used as in the case of EC regional policy. Coordination should then be primarily restricted to monitoring and evaluation procedures and to technical assistance. But as far as fundamental policy competences are concerned, the lack of a normative justification for an independent EC regional policy, which would be based on the objective of cohesion, and the political nature of EC redistribution make it necessary to implement strict constitutional and fiscal constraints to control EC expenditure policy.

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