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The geography of inequalities in Europe

Philippe Martin*

Summary

■ This paper analyses some of the theoretical and empirical arguments that serve to legitimate regional policies in Europe. We start by reviewing the existing evidence that European integration has led to a process of convergence between countries but not between regions inside countries and suggest some mechanisms through which this can happen. Taking the example of France, we show that in the past twenty years regional divergence in production has indeed occurred. However, the geography of incomes has, during the same period, become more equal producing a “scissors effect” between the geographies of production and income. This suggests that transfers, which have nothing to do with regional policies, have, at least in France, more than compensated the increase in production inequality. Hence, “regional convergence” is not a synonym of “regional cohesion” at least at the national level.

We then review evidence on a possible trade-off between growth and regional inequalities to suggest that efficiency motives can not easily be used to defend regional policies. Both evidence and theory suggest that regional concentration leads to efficiency gains. This also implies that the EU is faced with a choice it has tried to avoid until now. Either, it puts its effort in slowing or even reversing the process of spatial economic concentration at the national level or it concentrates on policies to speed up the convergence process between poor and rich countries. Finally, we analyse the relation between spatial and social inequalities. We report empirical evidence for Europe that suggests a strong empirical relation between the two: even after controlling for transfers and other possible determinants of individual inequalities, we find that countries with more regional inequalities are also those with more individual inequalities. ■

JEL classification: H2, H7 and R0.

Key words: Economic geography, regional inequalities and regional subsidies.

* *Philippe Martin is Professor at the Université Paris-1 Panthéon Sorbonne and CERAS-ENPC and a Research Fellow at CEPR.*

The geography of inequalities in Europe

Philippe Martin*

The concern for cohesion is an important feature of the process of European integration. While the Single Market offered the promise of increased output and efficiency for the EU as a whole, it is often argued that the viability of the project, in social and political terms, requires that the gains are fairly distributed across countries and regions. This has led to a large increase in funds for regional policies and an explicit mention of the objective of reducing regional disparities in the Single European Act (Article 1). The EU has been devoting an increasing share of its budget to regional policies. The Structural Funds and the Cohesion Fund represent over one third of the 2004 Community budget.

At the European level, the goal of the cohesion policy is not precisely defined: it can broadly be interpreted as to reduce the welfare differences among European regions. Article 158 of the amended Treaty of Amsterdam (1997) establishing the European Community reads:

“...the Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas”.

This is broad because it could be interpreted as reducing inequalities between countries or between regions inside countries. Moreover, regional policies are often presented by policy makers as part of a broader objective to reduce inequalities between the poor and the rich. Regional cohesion is seen as a prerequisite for social cohesion and this is the main reason why regional inequalities should be reduced. There is an implicit assumption here: that the spatial dimension of inequalities is an important determinant of inequalities between individuals at the national level. This is an important assumption, because it implies that social transfers that are not spatially de-

** I thank two referees as well as Karolina Ekholm for helpful suggestions. All remaining errors are mine.*

fined (unemployment benefits, national income taxes, social security transfers etc.) are not enough to ensure social cohesion at the national level.

In this paper, we argue that regional policies, as they exist today in Europe, are based on shaky grounds both from an empirical and theoretical point of view. We start by reviewing the existing evidence that European integration has led to a process of convergence between countries, but not between regions inside countries. Some mechanisms are suggested through which trade integration in Europe can lead to a process of convergence between countries but not between regions inside countries. This will in particular be the case if, due to European structural and institutional features, poor regions cannot exploit their comparative advantage relative to rich regions as well as poor countries can exploit their comparative advantage relative to rich countries. Taking the example of France, we show that in the past twenty years, regional divergence in production has indeed occurred. However, the geography of incomes has, during the same period, become more equal, thereby producing a “scissors effect” between the geographies of production and income. This suggests that transfers, which have no relation to regional policies, have, at least in France, more than compensated for the increase in production inequality. Hence, “regional convergence” is not a synonym of “regional cohesion”, at least not at the national level.

We then review evidence on a possible trade-off between growth and regional inequalities to suggest that efficiency motives can not easily be used to defend regional policies. Both evidence and theory suggest that regional concentration leads to efficiency gains, so that regional policies attempting to reduce such spatial concentration cannot be based on strong efficiency grounds. This also implies that the EU is faced with a choice it has tried to avoid until now. Either, it puts its effort into slowing or even reversing the process of spatial economic concentration at the national level, or it concentrates on policies to speed up the convergence process between poor and rich countries. Finally, we analyse the relation between spatial and social inequalities. We report empirical evidence that suggests a strong empirical relation between the two in the EU.

1. Regional convergence and divergence in Europe

1.1. Global convergence and local divergence

Spatial inequalities have developed among the European countries and among the countries' own internal regions in different ways. Table 1 below illustrates the development of those disparities measured by the standard per capita GDP deviation for the NUTS2 regions for the year 1990 and the period 1995-2000. In eight countries, internal regional disparities have increased since 1995. The last two lines of the table also show that while inequalities among countries diminished, those among the countries' own internal regions on average increased somewhat. The data also suggests that disparities increased especially in countries with initially low disparities and decreased in those countries with initially high disparities.

Detailed studies have shown (Duro, 2001) that up to the mid-eighties, GDP per capita inequalities among member states represented half the inequalities among the European regions, and inequalities among regions within each state represented the other half. Since then, inequalities among states have diminished by 25 percent, but regional inequalities within states have increased by 10 percent. As a result, regional inequalities in Europe are mainly explained by inequalities within countries. Thus, Europe is experiencing a process of convergence among countries at the same time as a process of non convergence or divergence among the countries' own regions: all convergence among regions in Europe at the European level is thus explained by the convergence among countries.

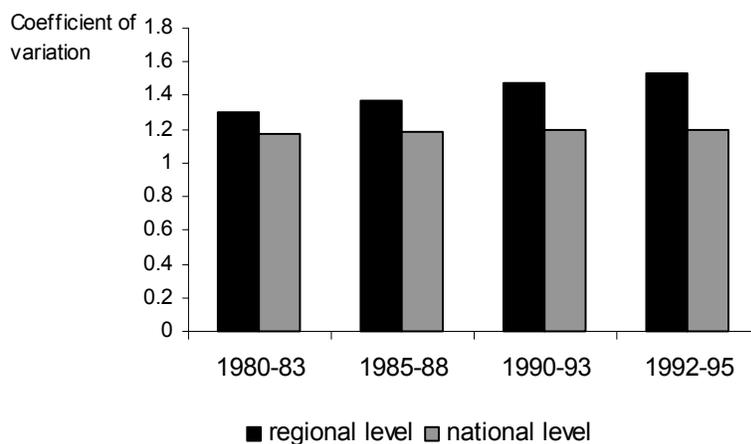
Further evidence on the subject is given by Midelfart-Knarvik and Overman (2002). Figure 1 shows the coefficient of variation (the standard deviation divided by the mean) for the distribution of manufacturing activity across states and regions in the EU. At the national level, this index of geographical concentration remains roughly constant over time. However, at the regional level geographical concentration is more pronounced and has been increasing over time.

Table 1. Regional disparities in per capita GDP within the member States, 1990-2000.
NUTS2 (Standard deviation of index EU15=100)

Member State	1990	1995	1996	1997	1998	1999	2000
Belgium	..	40.8	41.6	41.6	41.6	40.2	39.4
Germany ^{a)}	21.8	20.1	20.5	20.9	21.0	21.5	22.1
Greece	6.3	10.4	10.3	9.5	9.5	9.5	9.6
Spain	14.9	16.8	17.1	17.4	17.4	18.1	18.1
France	28.9	28.2	27.9	27.3	26.6	27.5	28.3
Italy	24.8	28.5	28.9	27.7	28.1	27.8	27.2
Netherlands	10.6	13.5	14.6	15.3	15.7	15.8	15.5
Austria	27.5	25.4	24.8	23.6	22.7	22.5	23.9
Portugal	13.5	15.2	15.4	17.3	17.9	17.6	16.6
Finland	17.9	19.5	21.2	20.8	23.9	24.2	25.0
Sweden	10.9	12.0	13.0	15.2	16.3	20.1	20.9
GB	20.2	31.5	32.0	34.0	35.6	34.2	34.2
EU15 (by member state)	12.5	12.5	11.8	11.6	11.7	11.0	11.4
EU15 (within member states)	26.5	28.3	28.1	28.2	28.5	28.2	28.5

Source: European Commission (2002). ^{a)} Excl. New Länder.

Figure 1. Geographical concentration of economic activity



Source: Midelfart-Knarvik and Overman (2002).

At the EU level, a similar development in spatial polarization may be described for unemployment. Overman and Puga (2002) show that since the mid-eighties, regions starting out with a low or high unemployment rate have not shown much change in their relative situation. Regions with intermediate unemployment rates, on the other hand, have developed toward extremes. The authors interpret this result as an effect of the spatial polarization of economic activities due to economic integration. They show that the fate of regions in terms of unemployment is much more closely linked to the results of neighbouring regions (whether or not they belong to the same country) than to that of the respective country itself.

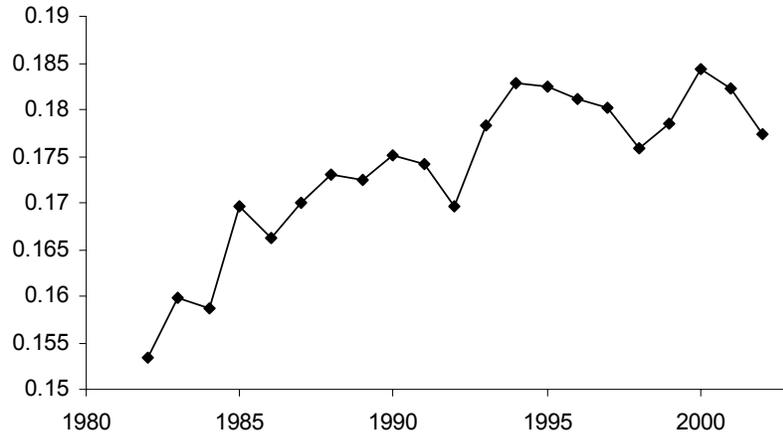
To sum up, trade integration in Europe has helped convergence between countries. However, it has not fostered convergence between regions inside countries. In some cases, regional disparities have increased. Spatial polarization has occurred both in terms of income and unemployment.

1.2. The geographies of production and income diverge: The French case

However, this picture is misleading if it leads to the conclusion that social inequalities have increased between regions inside Europe. A contradictory image may emerge if one looks at regional inequalities of disposable income, i.e., income net of transfers. Here, we only look at the French example. For French regions, the difference is quite striking. Figure 2 shows the coefficient of variation across French NUTS2 regions from 1982 to 2002. There is a clear upwards trend of regional inequalities in production during the period.

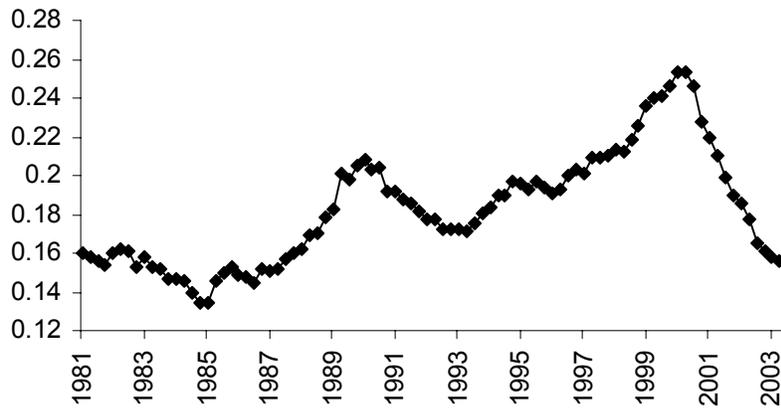
Figure 3 gives the same measure of regional inequalities for the unemployment rate from 1981 to 2004. In the 1980's up to the 1990's, regional inequalities also increased. However, and quite surprisingly, recent years show a very dramatic decrease in this measure of inequality. It is known that regional inequalities in unemployment are countercyclical (high unemployment regions have more stable unemployment rates than low unemployment regions), so that the latest drop is partly cyclical and reflects the recent increase in unemployment in France.

**Figure 2. Coefficient of variation French NUTS2 regions
(GDP per capita 1982-2002)**



Source: Insee.

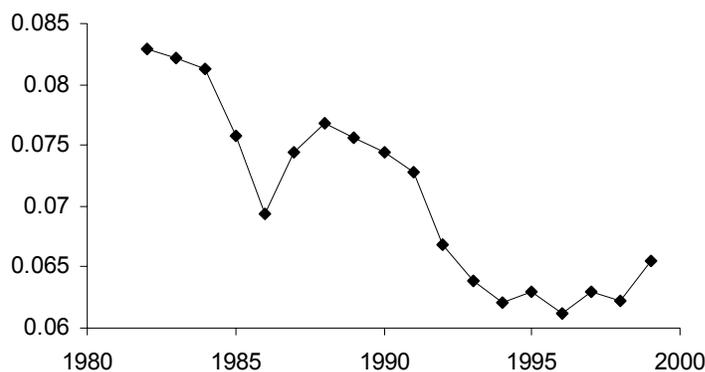
**Figure 3. Coefficient of variation: Unemployment
French NUTS2 regions: 1981-2004 rate**



Source: Insee.

Figure 4 gives a very different picture. It shows the coefficient of variation of disposable income for NUTS2 regions from 1982 to 1999 (later data is not available). First, and not surprisingly, the inequality is less for disposable income per capita than for GDP per capita. On average, the regional inequality in GDP per capita is more than double the inequality in disposable income. More surprisingly, even though the first measure increased by more than 2 percentage points, the second measure actually decreased by 2 percentage points. As stressed by Davezies (2001), there is a growing disconnect between the geography of production (becoming more unequal) and the geography of incomes (becoming more equal) so that “regional convergence” is not a synonym of “regional cohesion”. The reason for this is that inter-regional income transfers are important even though nothing much is known about them. In particular, it is difficult to quantify the impact of public versus private transfers in the difference between GDP and income at the regional level.

Figure 4. Coefficient of variation French NUTS2 regions (Disposable income per capita 1982-1999)



Source: Insee.

This French disconnect between the geography of production and the geography of income is not a general phenomenon, however. Unfortunately, we do not have data for other countries to draw general conclusions. There is, however, evidence (see Monastiriotis, 2003)

that in the UK, both types of regional inequalities (in terms of GDP per capita and in terms of disposable income) have increased in the past twenty years. This suggests that the evolution of the welfare state is key. Whereas in France, during the past twenty years, transfers (due to the progressivity of the income tax, social security, unemployment benefits etc.) have increased, this has not been the case in the UK. The important point is that regional policies certainly do not explain much of the difference between UK and France. In France, national regional policies that attempt to give incentives (essentially through tax cuts) for firms to locate in the poorest regions (the “politique d’aménagement du territoire”) are very active, although it is difficult to evaluate their real impact, in part because the government does not provide much data. In the UK, on the other hand, these policies are much less important. This suggests that interregional transfers are very large and growing in France. It also suggests that they are mostly due to progressive income taxes and the welfare state, not to spatially defined policies such as regional policies.

2. A tentative explanation for global convergence and local divergence

The presence of economies of scale and trade costs may explain why regions with no obvious comparative advantage in certain activities can become centres of production of those activities. A model of the underlying mechanisms was introduced by Krugman (1991), who was at the origin of the so-called “new economic geography” (see also the paper by Baldwin, 2005, in this issue). The central finding of this literature is that the reduction of trade costs may engender a concentration of economic activities in certain regions that have better access to the large markets, even if they do not have the lowest production costs. This spatial concentration is advantageous because of the existence of economies of scale conducive to limiting production locations, and it is made possible by trade integration which, while reducing transaction costs, does not oblige enterprises to be located close to all their consumers.

Here, we simply want to very briefly analyse what are some of the necessary conditions for a process of “local divergence” with “global convergence” to follow trade integration.¹ The interaction of econo-

¹ In the context of the footloose capital model, Andres (2004) shows a similar result in a general equilibrium framework.

mies of scale, comparative advantage and trade costs is essential. The purpose of the small “model” we provide here is simply to illustrate a mechanism which we believe may be more general. Suppose there are three regions. The first, which, for illustrative purposes, we call the Ruhr, is a rich and central region with high wages and hence, high labour costs. The second region, which we call Catalonia, is a middle-income region close to the large European markets. A third region, Andalusia, is a peripheral region with low wages and hence, low labour costs. Economies of scale play a major role in the sense that average production costs increase with the number of locations due to fixed costs. Let us assume that the firm can produce in the three regions, or in one only.² The choice of location is simply a minimization of the sum of production and trade costs.

If the firm decides to produce in the three regions, its total cost is:

$$TC(R + C + A) = 3F + c_R S_R + c_C S_C + c_A S_A,$$

where F is the fixed cost associated with each plant, c_R, c_C, c_A are the marginal costs of production (that can be interpreted as the wage costs) in the Ruhr, Catalonia and Andalusia, respectively. We assume that $c_R > c_C > c_A$. S_R, S_C, S_A are the market sizes in the Ruhr, Catalonia and Andalusia, respectively. However, we assume that $S_R > S_C > S_A$. Note that in this situation, the firm pays no trade or transport costs as it produces in all three locations.

If the firm produces in the Ruhr only, its total cost is:

$$TC(R) = F + c_R(S_R + S_C + S_A) + t_I(S_C + S_A) + t_D S_A,$$

where t_I is the international trade cost which the firm located in Germany has to pay to sell in Catalonia and Andalusia. To sell in Andalusia, the firm also has to pay the domestic Spanish trade cost (which can be interpreted as a transport cost) as this region is in the periphery.

If the firm produces in Catalonia only, its total cost is:

$$TC(C) = F + c_C(S_R + S_C + S_A) + t_I S_R + t_D S_A,$$

² The firm could, of course, produce in two regions. This possibility would complicate the presentation without adding much.

so that it pays the international trade cost to sell in Germany and the domestic Spanish cost to sell in Andalusia.

Finally, if the firm decides to produce in Andalusia, its total cost is:

$$TC(A) = F + c_A(S_R + S_C + S_A) + (t_I + t_D)S_R + t_D S_C.$$

Suppose we start from a situation where international trade costs t_I are very high. In this situation, which we interpret as the pattern before the European integration process, the firm will want to locate some activity in the three locations. It is easy to check and it is intuitive indeed that if t_I is high enough (and domestic transport costs are not too low either), then: $TC(R + C + A) < TC(R)$, $TC(C)$, $TC(A)$ and any other location equilibrium. This just says that if trade costs are high, firms will want to be close to all their consumers.

Suppose now that Spain and Germany lower their trade costs, t_I . In a highly stylized way, we interpret the scenario of “global convergence with local divergence” as a case when the firm chooses to locate in Catalonia only. In this case, Spain as a whole gains some economic activity but Andalusia loses it.

This will be the case under the following conditions:

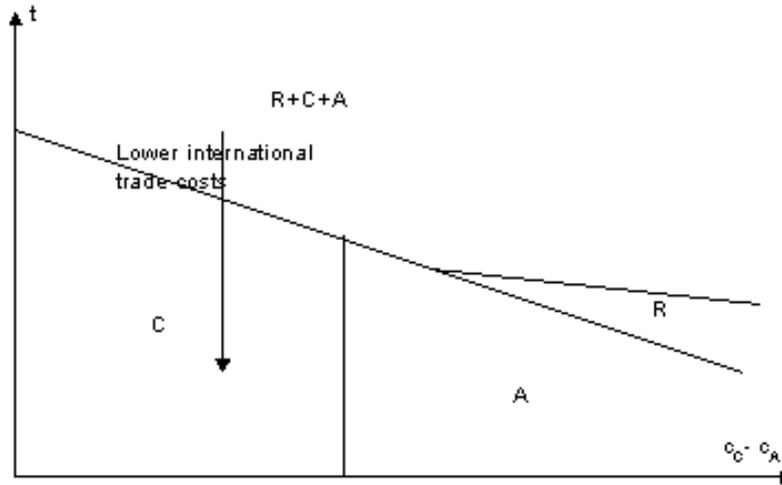
- 1) $TC(R + C + A) > TC(C)$;
- 2) $TC(R) > TC(C)$;
- 3) $TC(A) > TC(C)$.

It can be checked that condition 1) is fulfilled when fixed costs are sufficiently high, international and domestic trade costs are sufficiently low, the international cost advantage of Spain over Germany is sufficiently high but the cost disadvantage of Catalonia is relatively small compared to Andalusia. Condition 2) applies for some of the same characteristics as 1) but also requires that the overall Spanish market is not too small compared to the German market. Finally, condition 3) requires, on top of some of the characteristics above, that the domestic cost in Spain is not too small.

Figure 5 below shows an example of some possible outcomes of locations depending on combinations of international trade costs t_I and national cost differences between the two Spanish regions, $c_C - c_A$. It illustrates that the scenario of global convergence and local divergence (going from location pattern R+C+A to the location in C only)

is possible when international trade costs are lowered and the difference in production costs between C and A is low enough.

Figure 5. The possibility of global convergence and local divergence following European trade integration



Overall, this example suggests that international integration (lower t) can lead to global convergence and local divergence, if the international cost advantage of the poorer country is larger than the national cost advantage of the poorer region. One might think that the European practice of nationally uniform minimum wages (and more generally of labour institutions) coupled with different labour costs between countries can produce exactly such a situation. The example also suggests that such a scenario will occur in countries for which the richest region has both a large domestic market and good market access to other rich regions. In this case, market access is the main driving force of location between regions inside countries and differences in the cost of production are the main driving forces of location between countries.

Lower domestic transport costs in Spain, for example due to infrastructure projects financed by Structural Funds, may not produce local convergence. This has, for example, been shown in Martin and Rogers (1995). In this example, it can be checked that when domestic

trade costs are high, the firm prefers to locate production in both Spanish regions, in order to serve the local market. At intermediate levels, the firm will prefer to concentrate its production in the richest of the two regions and save on transport costs. At low levels of transport cost, the difference in production costs becomes the most important factor determining the firm's choice of location, which presumably favours the poorest region. Note, however, that if, again for institutional reasons, differences in production costs between regions inside countries are constrained to be small, then regional policies that build transport infrastructures between rich and poor regions will only emphasize the market size differences between those regions.

Overall, this analytical framework suggests quite intuitively that the interaction of economies of scale and trade costs may produce a scenario of global convergence with local divergence following trade integration if poor countries—but not, or to a lesser extent, poor regions—can take advantage of their “natural” comparative advantage. Note also that this same mechanism that leads to the global convergence/local divergence phenomenon can also explain why regional policies emphasizing transport infrastructure may not be successful in decreasing inequalities between poor and rich regions (see Martin, 2003, for a review of the evidence on the effects of regional policies in Europe).

3. Regional policies and the possibility of a tradeoff between equity and efficiency

A motivation for public intervention at the regional level, put forward by the Commission, is that of efficiency. In geographic disequilibria, it sees “an underutilization of economic and social potentials and an inability to take advantage of opportunities that could be beneficial to the Union as a whole”.

This motivation is much less clear than the equity based motivation, to which we will return. If the phenomenon of spatial concentration is explained by the existence of economies of scale, this means that spatial agglomeration is at the origin of economic gains. This will be the case if firms can benefit from the proximity of other enterprises in the same sector to diminish their costs (transport costs or fixed costs). This will also be the case if such concentration makes it possible to increase the firms' productivity through localised spillover effects, i.e. if the firms can receive transfers of knowledge from other

neighbouring businesses. These localised spillovers have been documented in numerous studies (see, for example, Jaffe et al., 1993) and the existence of agglomeration gains has been extensively discussed by economists since they were described by Marshall in 1890. The example of Silicon Valley shows the advantage a country can obtain from a very heavy spatial concentration of activities with positive technological externalities. The stronger spatial concentration of innovation-based activities in relation to production activities thus has an economic rationale, and the benefits of this spatial concentration go beyond private gains. Another gain from agglomeration, both for workers and firms, is labour pooling: firms benefit from a large spatial concentration of specialised workers in an area because they can easily hire from this large pool.

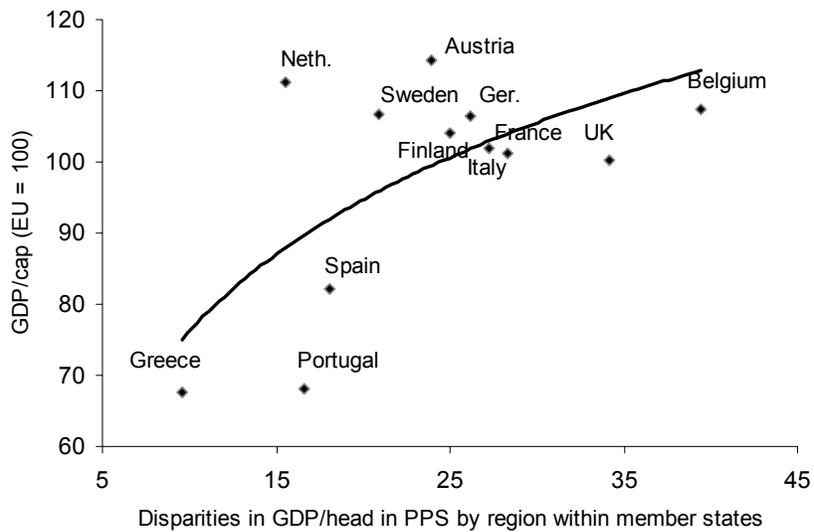
The objective of policies promoting a greater dispersal of economic activities is based on the assumption that the economic geography produced by market forces alone is too concentrated. However, the efficiency argument may demand more or less spatial concentration: on the one hand, the economic gains of spatial agglomeration discussed above and, on the other, the effects of congestion (as, for example, reflected in pollution or the high price of fixed factors such as land). The fact that in Europe, the convergence of countries is accompanied by national divergence makes one think that the former type of argument, efficiency gains with spatial concentration, has pride of place. In this case, a tradeoff between equity and spatial efficiency appears (see Martin 1999; and Baldwin et al., 2003). It is difficult to quantitatively assess this tradeoff. Figure 6 shows the relation between the levels of regional disparities and GDP per capita in the larger EU15 countries. Denmark, Ireland and Luxemburg are excluded because of lack of regional data for those small countries. Two groups appear clearly. The three poorest countries (Greece, Portugal and Spain) have the lowest level of regional disparities. The second group of countries, the relatively rich, have an average level of regional disparities, which is clearly above the first group. However, no obvious relation appears inside this group. The positive relation between the overall country growth of GDP and the growth of regional disparities during the period 1994-2000 appears more clearly in Figure 7.³ Naturally, this positive correlation should be taken with much cau-

³ The relation is given in log because it does not appear to be linear.

tion. It is suggestive of the possible existence of a tradeoff between spatial equity and growth, but such a correlation may not be causal.

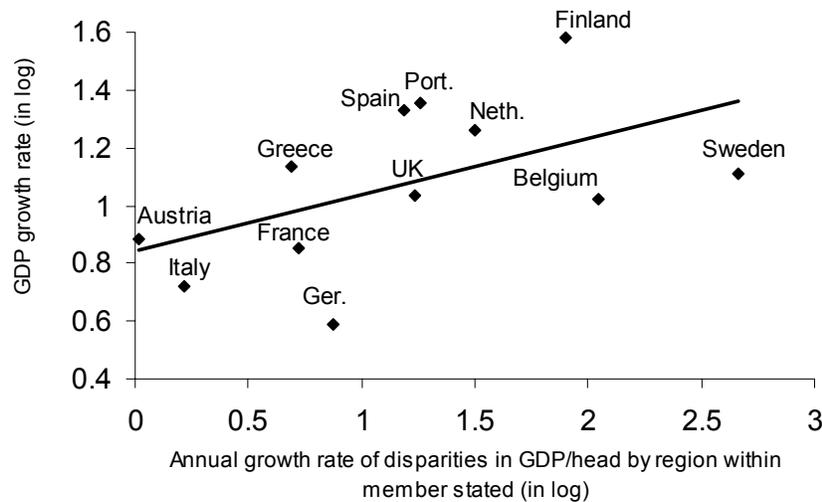
Other evidence is provided by Ciccone and Hall (1996) for the US and Ciccone (2002) for Europe. Both find that employment density has a positive effect on productivity levels. Recent econometric work by Crozet and Koenig (2005) gives a more precise picture of this tradeoff in Europe. They find a positive relation between the GDP per capita growth of a region and the change in the level of inequalities inside the region. The effect is also economically significant: a 10 per cent increase in the standard deviation index of GDP per capita within a NUTS1 region leads to a 1.6 per cent increase in regional GDP per capita.

Figure 6. GDP/head and regional disparities (year 2000)



Source: Eurostat.

Figure 7. Growth and regional disparities (year 1995-2000)



Source: Eurostat.

The existence of such a tradeoff has consequences for the definition and quantification of objectives of regional policies, in particular in the case of the new entrants. It implies that a strategic choice has to be made between the objective of lowering or stabilising the absolute differences in GDP per capita between regions inside countries and the objective of fast convergence towards the rest of the EU. The decisions of which infrastructure projects to finance and where to locate them are obviously dependent on this strategic choice between external and internal convergence. In this matter, an interesting choice was made by Ireland which decided to be defined as a single NUTS2 region rather than as several small regions, which would have implied a high degree of spatial inequality. As emphasized by Davezies (1999), it therefore took the risk of being more rapidly excluded from the benefit of the Structural Funds, but it could choose to develop projects in those regions which provided the highest national return.

To sum up, spatial agglomeration of economic activities may (at least up to a certain point where congestion effects may become too

large) have positive efficiency effects and may be a welcome consequence of trade integration. This implies a trade-off for regional policies between efficiency and equity.

4. Inequalities between regions and inequalities between individuals

4.1. The equity motive behind regional policies

Equity is the other traditional motivation for regional policies after efficiency. Certain economic agents, be they workers or consumers, are not mobile and are therefore condemned to live in poor or declining regions from which the mobile factors (capital and highly skilled workers) have departed. Because of the lower labour demand in such regions, real wages will adjust downward or, if real wages do not adjust because of labour market rigidities, unemployment will increase. In both cases, the welfare of the inhabitants will deteriorate. As consumers, those agents will also see their welfare deteriorate since certain goods and services will no longer be produced locally (the businesses have left for more wealthy regions). In certain cases, in particular for certain services, the transaction costs will become so high that they can no longer be consumed by those agents. Thus, the diversity of consumable goods and services in the poor region will decline.

Moreover, the most mobile agents are in general those with the highest level of human capital (education, experience etc.). Thanks to the possession of “positive externalities” in the form of localized social interactions, such agents have a positive impact on productivity and thus, on the real wages of other workers. By leaving a region in decline, the most productive workers thus also have a negative impact on the productivity of the remaining workers, i.e. those who are the most disadvantaged. There is thus an absence of market coordination, given that when certain agents decide on their location, they do not take into account the effect of their choice on other agents. From that standpoint, the possibility of a market failure, with the consequent increase in inequalities that is specific to the spatial dimension of the economy, exists and may thus serve as motivation for public intervention.

There are several ways to analyse the impact of the agglomeration phenomenon on the least mobile agents. The first would be to refuse to see it as a problem of equity, but to interpret it as coming from a

specific market failure. In Europe, except in the UK, promoting the spatial mobility of workers is not considered a solution to the problems of regional inequality. This is legitimate, but only partially so, since there will always be a substantial fringe of workers who will be harmed by geographic inequalities because of cultural and social obstacles. The vision of regions empty both of inhabitants and economic activities (such as the Dakotas in the United States) is unacceptable in Europe.

4.2. Are spatial inequalities in production correlated to social inequalities?

Policy makers often argue that a strong rationale for decreasing regional inequalities is that it is part of the wider objective to decrease inequalities between individuals. Spatial cohesion is part of an overall objective of social cohesion. This is based on the belief that there is a strong relation between spatial inequalities and individual inequalities, so that regional policies that decrease spatial inequalities can also decrease individual inequalities.

From a theoretical point of view, it is not obvious that countries which are spatially more unequal, are also those with a more unequal income distribution. The problem comes from aggregation, which is well known to those who have studied the dynamics of inequalities at the international level.

Take a simple example of two countries, A and B, each of them comprised of two regions, 1 and 2, each with the same population of 50 individuals. Both countries have the same average GDP and GDP per capita. Country A has no spatial inequality; its two regions have the same income per capita. However, in both regions, the distribution of income is highly unequal. Say that 10 per cent of the individuals each earn 10 and 90 per cent of the individuals each earn 1. So the overall inequality as measured by the percentage of total income that goes to the richest 10 per cent, is $100/190 = 53$ per cent. Hence, this is a very unequal society, even though there is no spatial inequality. The other country has a different distribution of total income. In region 1, 20 per cent of the population each earn 5.5 and 80 per cent 1.5, so that the average income per capita in the region is 2.3. In the other region, all earn 1.5. Hence, spatial inequality is quite large in this case, as the income per capita in the rich region is more than 50 per cent larger than in the poor region. However, the distribution of income at the country level is much less unequal than for country A: the

percentage of total income that goes to the richest 10 per cent of the population (all in the richest region) is $55/190=29$ per cent.

This illustrative example shows that higher spatial inequality measured by differences in income per capita across regions does not automatically generate a more unequal distribution of income. Moreover, in our example, a spatially based redistributive policy would seem unfair to the “poor” of the rich region. An income transfer from region 1 to region 2, even if financed by the rich of the richest region, would artificially create an inequality between the “poor” of the rich region and those in the poor region. Such a transfer from the rich to the poor region would increase certain measures of income inequality.

Hence, an obvious question is whether there is a relation between spatial and social inequalities. One way of checking whether such a relation exists is to regress a measure of interpersonal inequality (namely, the log of the ratio of the mean net income of the top decile to the bottom decile) on likely determinants of interpersonal inequality as well a measure of spatial inequality. Table 2 shows the results of such regressions for pooled data of 12 countries (Belgium, Germany, Greece, Spain, France, Italy, Netherlands, Austria, Portugal, Finland, Sweden and UK) and the seven years available (1995 to 2001). Again, the three countries (Ireland, Luxemburg and Denmark) with no NUTS2 regional data are excluded. The measure of spatial income inequality (SPATIAL) is the log of the coefficient of variation of income per capita at the NUTS2 level.

The first column shows the regression of inequality on the coefficient of variation (SPATIAL) and the log of income per capita (INCPERCAP), as it can be argued that richer countries are less unequal than poorer ones. We add year dummies to control for purely cyclical effects and country dummies for any omitted variables which are country specific. Spatial inequality is indeed positively correlated with individual inequality. Income per capita has a negative impact on interpersonal income per capita only in (unreported) regressions when country dummies are not included. An important question is whether, once national transfers are taken into account, spatial inequality still affects individual income inequality. If, when we control for such transfers, spatial inequalities do no longer affect individual inequalities, it can then be argued that national redistribution tools are sufficient for cohesion. To test this, we add the log of per capita expenditure on social transfers (SOCIAL), which we interpret as measuring

the country's preference for redistribution. Note that these are measures of national redistribution and not of regional policies. The interesting result is that introducing this crude measure of the national redistributive policy does not reduce the coefficient on spatial income inequality (SPATIAL). If anything, it increases the correlation between social and spatial inequalities.

In columns 3 and 4, we redo the exercise using a different measure of spatial inequality. Spatial inequality is now in terms of unemployment using the Commission measure "Cohesion" which measures regional dispersion of unemployment rates for each country. In this case, this measure of spatial inequality is not significantly correlated to income inequality. When, in column 5, we put both measures of spatial inequality into the regression, only the spatial inequality in incomes is significantly correlated with individual inequalities. The correlation is also quantitatively quite large. Given that the variables are in logs, the estimated coefficients can be interpreted as elasticities. Hence, a 10 per cent increase in spatial inequalities of incomes is associated with a 9.7 per cent increase in individual incomes, even after controlling for regional inequalities in unemployment, income per capita, social transfers, year and country fixed effects.

This exercise should obviously be interpreted with caution, as many other determinants may affect individual income inequalities. The direction of causality is also not obvious. Clearly, spatial inequalities could affect individual inequalities, but individual inequalities could also lead to spatial inequalities if agents (rich and poor) agglomerate in different regions. It suggests, however, that the link between regional and social inequalities indeed seems strong even when we control for year and country specific effects and that national redistribution policies do not seem fully able to eliminate the impact of regional income inequalities on social inequalities.

Table 2. Income inequality and spatial inequality

	(1)	(2)	(3)	(4)	(5)
SPATIAL	.772 ** (.238)	.805** (.234)			.972*** (.205)
COHESION			.107 (.110)	.093 (.139)	-.039 (.094)
INCPERCAP	.096 (.170)	-.020 (.176)	.134 (.076)	.190 (.163)	.036 (.203)
SOCIAL		.143 (.176)		-.087 (.299)	-.076 (.251)
Year fixed effects	yes	yes	yes	yes	yes
Country fixed effects	yes	yes	yes	yes	Yes
Number of observations	81	71	81	71	71
R squared (within)	0.96	0.96	0.96	0.96	0.97

Notes: (dependent variable: log of the ratio of the mean net income of the top decile to the bottom decile at the country level).

Source: Eurostat/Region; ***, **, * significant at 1 per cent, 5 per cent and 10 per cent; standard errors in parenthesis. The constant and dummy coefficients are not reported. All variables are in log.

4.3. Is there a spatial component to wage inequalities?

An alternative way of analysing the relation between spatial and social inequalities is to look at the determinants of wage inequalities. If a large part of the wage inequalities between individuals is explained by geographical factors, then indeed regional policies that induce relocation of industries towards poor regions may help decrease individual inequalities, even though it may not be the most efficient way of doing this. Work by Duranton and Monastiriotis (2002) and Gobillon (2002), however, suggests that this is only partially the case. The first paper uses data on average regional earnings in the UK during the 1982-1997 period. It shows a worsening of UK regional inequalities and a rise in the North-South gap. However, differences in education account for most of the aggregate divergence. London gained because its workforce became relatively more educated over the period. Second, returns to education increased nation-wide, which favoured the most educated regions (i.e., London). Third, returns to education were initially lower in London but they (partially) caught up with the

rest of the country. Had returns to education and their distribution across UK regions remained stable over the period, the UK North-South divide would have decreased.

Gobillon (2002) uses individual French data on wages to quantify the determinants of local disparities in wages during the 1978-1990 period. He finds that two thirds of the regional inequalities in wages are explained by the individual characteristics of the workers; in particular his or her level of education. Naturally, this leaves one third unexplained, but this is the maximum that could be accounted for by geographical factors.

These two studies suggest that a major reason for the increase in regional inequalities inside European countries may not have any significant relationship with geography of production per se. If returns to education have increased since the 1980s, which most labour economists believe, then the increase in regional inequality is at least partially a consequence of the increase in individual inequalities, itself caused by the increase in the return to education. A plausible story is that initially rich regions were well endowed with workers with high levels of education so that the increase in regional disparities in GDP per capita reflected the association of a general increase in the return to education and the initial geographical disparity in education levels. Furthermore, it is well known that better educated workers are more mobile, so that they may also have concentrated in the richer regions.

4.4. Can regional policies increase social inequalities?

The type of instrument used by regional policies also has important implications for the link between individual inequalities and regional inequalities. Most countries subsidize investment rather than employment at the regional level and this translates into subsidies to capital rather than labour (see Yuill et al., 1997; and Fuest and Huber, 2000). An important example is the subsidy program provided to Eastern Germany. According to Fuest and Huber (2000), 90 per cent of the subsidies to firms locating in Eastern Germany take the form of investment subsidies. At the European level, more than 400 types of subsidies exist that can help firms in poor regions. They take so many forms that it seems quite safe to characterize them as a complicated mix of subsidies to capital and labour.

Regional policies consisting of subsidising industries so as to give them an incentive to relocate in disadvantaged regions may have perverse effects on individual inequalities. If capital is mobile, subsidising

the return on capital in one region amounts to increasing its return in all regions. The reason is that if the return to capital is higher in one region than in another, in the long term, relocation will take place until the returns are equalised (see Dupont and Martin, 2003). Regional policies that subsidise capital in poor regions may actually imply transfers from the poor to the rich region as the increase in the return to capital will benefit the region with the highest share of capital ownership. Hence, even if they succeed in reducing regional inequalities, such subsidies to capital may end up increasing inequalities between individuals. This might be an extreme scenario, but it serves as a reminder that the choice of instruments used by regional subsidies is extremely important.

To sum up, a large share of regional inequalities come from individual inequalities, themselves produced by individual characteristics, in particular differences in the education level. This implies that regional policies that offer subsidies to firms locating in poor regions or financing infrastructure projects in those regions may only have limited effects on regional inequalities and that policies concentrating on education may be more efficient.

5. Conclusions

Public economic intervention must either be based on efficiency or on equity considerations. This paper has argued that the legitimacy of regional policies in Europe is not strong on either ground. A major rethink is required, based on simple principles in economics. On the efficiency motive, we have argued that increasing returns, which explain spatial economic concentration, also point to the efficiency gains of this process. Recent econometric evidence shows, in the European context, that these gains should be taken into account when defining regional policies. In the light of the recent enlargement, this is a crucial tradeoff. On the equity motive, the evidence suggests that national redistribution schemes (income taxes, social transfers, etc) that are not spatially defined do reduce spatial inequalities (at least in the French example), but may not be sufficient instruments to reduce social inequalities.

Regional policies in Europe do not take into account the fact that richer countries can more easily redistribute from rich to poor regions through national redistribution than poor countries. Even if it has the same GDP per capita as some regions in poorer countries, Corsica

benefits heavily from transfers from Ile de France, but this is not taken into account when designing European regional policies. Given the existence of these transfers at the national level, it is not obvious why European regional policies should focus on intranational regional inequalities. From this point of view, the recommendation of the Sapir report to renationalize regional policies to focus the impact of Structural Funds on inequalities between countries makes sense. The priority, especially after the enlargement, should be to speed up convergence between countries in Europe. It might be argued that this is at odds with the finding that European integration has fostered convergence between countries but not regions inside countries so that regional policies are not necessary for global convergence but for local convergence. However, inequalities between countries are much larger than between regions inside countries and national redistribution policies are powerful instruments for reducing the latter. Therefore, there is no real need for European regional policy to deal with intranational regional inequalities.

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