Convergence among EU Regions (1990-2001):

Quality of National Institutions and "Objective 1" Status[1]

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ABSTRACT:

This article focuses on convergence in terms of output per working-age person across regions in the European Union for the period 1990-2001. Controlling for the quality of national institutions, we investigate whether the status of "objective 1" region improves the speed of convergence as compared to what would be expected, given the regions' initial conditions. We find evidence of conditional convergence among EU regions, with the quality of national institutions having a positive impact, but no evidence on a correlation between the eligibility for objective 1 and faster convergence.

JEL classification: O40, O52.
Keywords: Convergence, economic growth, European Union, institutions.

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1. Introduction

Regional disparities within the European Union are significant. Roughly one-fourth of the European population lives in regions which have a per capita GDP below 75% of the EU15 average. In comparison, in the US, the same criteria would apply to only two states and 2% of the population.[2] The Amsterdam Treaty, in article 2, spells out the objective of strengthening economic and social cohesion in the European Union, while article 158 states that: "In particular, the Community shall aim at reducing disparities between the levels of development of the various regions as well as the backwardness of the least favoured regions, including rural areas". Income disparities are a matter of concern for both the Member States and the European Commission. The underlying justification for a cohesion policy with a territorial dimension is the belief that "market-driven" economic convergence is not sufficient on its own.

In practice, the EU has adopted an active cohesion policy, aiming to reduce income disparities by subsidising various types of investment programmes in the Union's poorest regions through the so-called Structural Funds. This policy was reinforced by the European Single Act of February 1986 (that came into force by mid-87), based, in the opinion of Jacques Delors[3], on the triptych "competition that stimulates, cooperation that strengthens, solidarity that unites", which led to a reform of the Structural Funds framework in 1989. As a consequence, funding for the less favoured regions has increased significantly, especially for those classified as "objective 1" [4]. Objective 1 regions receive about two-thirds of total structural funds. Against this background, this paper's purpose, to evaluate whether income disparities have indeed decreased as a result of the policy effort, is of considerable importance.

On the basis of a new data set, our analysis covers the period 1990–2001 in order to account for the effect of the 1989 Structural Funds reform. Our method consists of estimating simple growth equations that relate economic growth to the initial income level and other

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[2] D. Puga: European regional policies in light of recent location theories, CEPR Discussion Paper N° 2767, 2001.

[3] J. Delors: Foreword, in B. Ardy, I. Begg, W. Schelkle, F. Torres: EMU and Cohesion: Theory and Policy, Cascais, Principia, 2002.

[4] Since 1989, the European regional policy defines 5 types of priority regions, according to their needs. Regions eligible for objective 1 are those regions with GDP per capita below 75% of EU average.

variables[5]. The analysis controls for the quality of national institutions and explicitly investigates whether the status of "objective 1" improves, on average, the speed of convergence with respect to the expected speed.

Other authors who have assessed regional convergence in Europe using a similar methodology include Barro and Sala-i-Martin (1991), Sala-i-Martin (1996), Neven and Gouyette (1995) Paci (1997), Boldrin and Canova (2001) and Cuadrado-Roura (2000)[6]. Barro and Sala-i-Martin (1991) and Sala-i-Martin (1996) found evidence of convergence on per capita GDP, in the periods 1950-1985 and 1950-1990, respectively. These authors used national dummies to allow for the possibility of regions belonging to different countries to converge to different steady states. In contrast, Neven and Gouyette (1995), found no evidence of convergence among European regions over the period 1975-1989, in spite of including country dummies. Cuadrado-Roura et al. (2000), in turn, found evidence of convergence of *GDP per worker*, in the period 1977-1994. Paci (1997), using data for the period 1980-1990, and Boldrin and Canova (2001), experimenting with different sub-samples, also found evidence on convergence of GDP per worker, but not of GDP per capita. All these studies identified strong country effects, which were accounted for by means of national dummies. Country dummies are statistically convenient, but it is difficult to interpret them.

In this paper, we argue that the relevant variable to evaluate EU policy success in promoting economic cohesion is neither GDP per capita nor GDP per worker, but rather GDP per working-age person. This discussion is taken up in Section 2. In Section 3, we investigate whether poorer regions have shown a general tendency to grow faster than richer regions and test the significance of a dummy identifying the regions eligible for objective 1 funding. Instead of using country dummies, we control for country-specific effects, using a scale variable measuring the quality of national institutions. It includes the rule of law, bureaucracy, corruption, expropriation risk and government repudiation of contracts. Section 4 concludes.

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[5] See, for example, R. J. Barro: Economic growth in a cross-section of countries, Quarterly Journal of Economics Nº 106:2, 1991, pp 407-43.

[6] Robert J. Barro and Xavier Sala-i-Martin: Convergence across states and regions, Brooking Papers of Economic Activity Nº 1, 1991, pp 107-82. X. Sala-i-Martin: "Regional cohesion: evidence and theories of regional growth and convergence", European Economic Review, vol.40, 1996, pp 1325-52. D. Neven and C. Gouyett: Regional convergence in the European Community, Journal of Common Market Studies Nº 21, 1998, 757-74. R. Paci: More similar and less equal: economic growth in the European regions, Welwirtschaftliches Archiv, vol 133 Nº 4, 1997, pp 609-34. J. Cuadrado-Roura: Regional convergence in the European Union: from hypothesis to the actual trends, The Annals of Regional Science, nº35, 2001, 333-56. M. Boldrin and F. Canova: Inequality and convergence in Europe's regions: reconsidering European regional policies, Economic Policy, Nº 32, 2001, pp 207-253.

2. Cohesion accounting

The appropriate indicator to evaluate the impact of policy on cohesion depends on the concept of "cohesion" that we are looking at. Following the terminology of the first Cohesion Report (1996)[7], we focus on *economic cohesion*, which refers to the aim of promoting competitiveness and convergence through faster GDP growth in the poorest regions. Such an aim implicitly requires EU policies to raise the production capability of the poorer regions, thus creating conditions for faster growth, rather than simply promoting consumption through income transfers from the richer areas. As pointed out by Ardy et al. (2002b), the EU views cohesion as a development issue: one of the ways for the EU to achieve cohesion is through structural and cohesion funding that seeks to foster the long-term growth potential of regions, avoiding situations of dependence on those transfers and of high unemployment.[8]

The concept shall, then, be distinguished from the notion of *social cohesion,* which is related to the aim of ensuring that the least well-off have access to protection and services of general interest.

The second Cohesion Report (2001)[9] presents a number of indicators with respect to the different dimensions of cohesion. As far as economic cohesion is concerned, the chosen indicator is GDP per inhabitant. However, this variable is not the best indicator to assess regional competitiveness and the ability to generate income, given that per capita GDP is influenced by demographic factors and thereby includes an element that is more relevant for *social cohesion.*

In order to make our discussion clearer, we refer to the following accounting identity:

$$Y/N = (Q/N) (Y/Q) = (Y/Q)(Q/A)(A/N),$$

where Y denotes regional income, Q stands for regional production, N for population and A for working age population (from 15 to 64 years old).

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[7] European Commission: First Report on Economic and Social Cohesion, Commission of the European Communities, 1996.

[8] B. Ardy, I. Begg, W. Schelkle, F. Torres: How will EMU affect Cohesion?, in Intereconomics, 37 (November/December), 2002, pp. 300-314.

[9] European Commission: Second Report on Economic and Social Cohesion, Commission of the European Communities, 2001.

When the aim of the analysis is to evaluate whether standards of living are converging, then a possible measure is "per capita income", Y/N. Since this variable includes inter-regional transfers, it indicates how effective national and EU policies are in promoting a balanced income distribution among regions. Of course, since this indicator is neutral with respect to income distribution within each region, it should be complemented with other social and economic indicators when the aim of the analysis is to assess social cohesion.

The term Q/N measures the regions' production per inhabitant, which reflects the region's capability to produce on its own and distribute income among its citizens. It is an appropriate measure to evaluate whether a region should be a net recipient or contributor to other regions, as far as inter-regional cohesion is concerned. Not surprisingly, it is the indicator used in the EU to qualify for eligibility for cohesion funds.

Per capita production is not a good measure, however, to evaluate the success of cohesion policies in "enhancing competitiveness". This is because this variable is influenced by different factors, such as demographic changes, labour participation and productivity. Although labour participation and productivity are, to a large extent, endogenous to policy, demographic changes are not. An unfavourable demographic trend will impact negatively on Q/N, irrespective of the region's ability to generate production out of its labour force.

To illustrate the effect of demographic changes, we display in Figure 1 the growth differentials between each region Q/A and A/N and the EU average, from 1990 to 2001[10]. The analysis makes use of regional data on Gross Value Added (GVA) and population from the European Commission and covers the period 1990-2001. Gross Value Added is used instead of Gross Domestic product, because the aim is to measure the production capability and not the value of production after indirect taxes. The definition of region corresponds to the European Commission classification NUTS2 ("Nomenclature of Statistical Territorial Units"), which was elected as the geographical level at which the persistence or disappearance of unacceptable inequalities should be measured. The dashed line in Figure 1 shows the combinations of demographic trends and productivity changes that would allow a region's per capita GVA to remain proportional to the EU level. The regions appear in four different zones, according to their relative performance vis-à-vis the EU average. For example, the two Irish regions and Berlin enjoyed quite favourable dynamics, both in terms of demography and productivity change. Vlams Braabant is a case of a region with an unfavourable demographic trend that was offset by a fast productivity growth, as measured by the ability of this region to produce out of its working age population.

Açores and Sterea Ellada benefit from a rising working age population, but their performance in terms of productivity has been poor. Munster, Detmold and Ovre Norrland have faced quite unfavourable developments, both in terms of productivity and demography.

Although an unfavourable demographic development may be a problem for cohesion between EU regions and for "social cohesion" it should be controlled for when assessing the success of "competitiveness enhancement" policies. When the aim of the analysis is to evaluate the success of policies in enhancing regional competitiveness, the appropriate indicator is production per working age person (Q/A)[11]. This variable measures what a society gets out of its pool of human resources, irrespectively as to whether people with working age are employed, unemployed or even out of the labour force. In general, policies raising economic efficiency, education and capital accumulation will impact on Q/A, regardless as to whether the channel is labour productivity or incentives to work.

The working age population, A, includes individuals who are employed (L), unemployed (U) and out of the labour force (N-L-U). Hence, Q/A, may be broken down into three different factors:

$$Q/A = (Q/L)[1-U/(L+U)][(L+U)/A] = (Q/L)(L/A).$$

The term Q/L captures average "labour productivity", which may be revealing in evaluating the technology and the quality of the inputs being used in each region[12]. The term U/(L+U) is the unemployment rate. The term (L+U)/A is the participation rate. Since both the unemployment rate and the participation rate are endogenous to policy, they are often synthesised in only one indicator, L/A, called the "employment rate". In general, all components in this last equation are endogenous to policy. Although for policy purposes it may make sense to analyse each one separately, for a general evaluation of the impact of policy action on economic cohesion, the term Q/A includes all the relevant information.

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[10] Data is expressed at constant prices but not in Purchasing Power Parities. The reason is that there is no data on PPP at the regional level in Europe. Since national data is based on the observation of prices in the main cities, using national PPPs for the poorest regions of each country would cause a significant bias.

[11] Ireland provides a suggestive case for distinguishing Q/N from Q/A. Because of a baby boom in the 1970s, the ratio A/N in Ireland (relative to EU) rose at an average rate of 0.9% per annum in the period 1986-2000. This purely demographic effect translated into a faster growth of relative Q/N (3.7% a year) than relative Q/A (2.8%). For a discussion of the Irish case, see M. L. Freitas: Quantity versus Quality: Growth Accounting in Ireland, Bank of Portugal Economic Bulletin, March 2000, pp. 59-70.

[12] With some caution, of course, as it measures production "per employee" rather than "per hour worked". The European Commission computes labour productivity measuring employment in terms of full time equivalents, but there is no data available at the regional level.

3. Convergence among EU regions

Figure 2 graphs on the x-axis the 1990 level of gross value added per working age person (Q/A) and on the y-axis the growth of this variable from 1990 to 2001[13]. At a first glance, the graph does not suggest any strong tendency for poorer regions in the EU to grow faster than richer regions. However, the results of a formal regression analysis, in Column 1 of Table 1, suggest that some convergence is taking place. The coefficient on the initial level of Q/A is negative and significant, indicating that, on average, poorer regions have grown faster[14]. Still, the adjusted R-squared is very low (0.02), indicating low explanatory power. This is not a surprising result, as the regression equation implicitly assumes that all regions in the EU are converging to the same level of per capita income. To the extent that regions differ in terms of their fundamentals, however, this is not a reasonable assumption.

Differences in the steady-states may be controlled for adding other explanatory variables to the regression equation. In the literature, variables like the saving rate or proxies for the investment in human capital are often specified as exogenous variables[15]. However, it has been argued that these variables are themselves endogenous to more fundamental aspects, namely the quality of the institutional framework. The main interpretation is that, although productivity and physical and human capital accumulation are crucial for economic growth, cross-country differences in productivity and propensity to invest are mostly explained by the degree of institutional development[16]. Since institutions drive the system of incentives in which economic agents interact, they not only affect the level of per capita income through a direct effect on efficiency, but also

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[13] Brandenburg (GER), Saarland (GER), Sachsen (GER), Sachsen-Anhalt (GER), Thuringen (GER) and French Overseas Departments (FR) are excluded because of non-availability of data.

[14] Note that this does not necessarily imply that the dispersion of GVA per working age person has decreased. For a discussion, see M. Friedman: Do old fallacies ever die?, Journal of Economic Literature Nº 30(4), 1992, 2129-2132.

[15] See, for example, G. Mankiw, D. Romer and D. Weil: A contribution to the empirics of economic growth, Quarterly Journal of Economics 107 (2), 1992, pp 407-38.

[16] This view is strongly related to the Nobel Prize Douglas North (See, for example, D. North: Institutions, Institutional Change and Economic Performance, Cambridge UK: Cambridge University Press, 1990). In the last few years, there has been a renewed interest on the role of institutions on economic growth. Recent works pointing to an overriding role for the quality of institutions in regressions explaining economic growth includes, for example, D. Rodrick, A. Subramanian and F. Trebbi: The Primacy of Institutions over Geography and Integration in Economic Development, NBER Working Paper 9305, October 2002, and R. Hall, and C. Jones: Why do some countries produce so much more output per worker than others? The Quarterly Journal of Economics 114 (1), 1999, 83-116.

indirectly, through its impact on the work effort, on the propensity to accumulate human and physical capital, on invention and technology transfer.

For the case at hand, it is important to distinguish national institutions from regional institutions. To the extent that regions belonging to a given country share the same legal system, the functioning of justice and the protection of property rights, they will tend to approach each other in the long run. However, to the extent that regional authorities have ruling power, their own bureaucracy or ability to impose taxes, regions in the same country may exhibit different steady states. Ideally, one would like to control for both types of forces. However, there is no obvious available proxy for the quality of regional institutions. Hence, our approach is to control for the quality of national institutions and then use the regression residuals to learn about the role of local governance.

Estimates in Column 2 of Table 1 include a variable measuring the quality of national institutions and a country dummy for Ireland. The index of institutional quality (INST) refers to the late 1980s and is borrowed from Sachs and Warner (1997)[17]. It is an average of 5 sub-indexes, capturing the rule of law, corruption, bureaucracy, expropriation risk and government repudiation of contracts. To the extent that these attributes are equally shared by the different regions in each country, they will capture convergence within the country. The results in Column 2 reveal a better fit than those of Column 1. The institutional quality variable has a positive coefficient, as expected, and is significant at 10%. This suggests that European regions are not converging to the same level of per capita income.

Figure 3 graphs the relationship between growth and initial Q/A, after taking out the effect of INST. Visual inspection of Figure 3 does not suggest that Objective 1 regions (the poorer regions) have grown faster than predicted by the regression equation. To assess this formally, in Column 3 of Table 1, we repeat the exercise, including a dummy that takes the value 1 for the regions under objective 1. The dummy is allowed to affect both the constant and the slope of the convergence line. If cohesion funds were successful in improving the speed of convergence vis-à-vis which would be expected given their initial position and attributes, the impact on the constant should be positive. In Column 3 of Table 1 we see that the objective 1 dummy does not improve the fit. This suggests that no extra growth was achieved by those regions that enjoyed the status of objective 1. This result is in light with Boldrin and Canova (2001, op cit.), who found that, with

[17] J.D. Sachs and A. M. Warner: Fundamental sources of long-run growth. American Economic Review Papers and Proceedings, 1997, May, pp 184-188.

exception of Ireland, EU regions that are recipients of EU transfers have performed no better than other regions.

One may argue that, what is important for growth is not the eligibility of the region for a particular supporting framework but rather the effective support actually received. Perhaps, this is true. However, the amount of funds that flow into a region depends both on the framework and on the ability of the citizens to take profit of this framework. Hence, when one uses the amount of funds received as explanatory variable, one captures both the policy and region specific factors, such as the quality of local governance, the prevailing incentives and so on. By testing the significance of the "status" only, we let all the factors that are specific to the region to be captured by the regression residuals.

Returning to the regression of Column 2, we verify that the proportion of the variance of the dependent variable that is explained by the regressors is only 23.5%. This means that other factors that are not controlled for, such as the ability of local governance to seize the opportunity of EU funds, may be important to distinguish regions in the same country.

The importance of these "omitted factors" may be evaluated by the vertical distances between each region's position in Figure 3 and the regression line. Whenever a region is above the regression line (positive residual), this means that the region grew faster than predicted, given the attributes we are controlling for. A negative residual means that the region's performance was worst than the expected, given the attributes. The 25 regions for which the distance with respect to the regression line was larger (the major outliers in regression 2 plus the two Irish regions) are depicted in Figure 4. Remarkably, among the major outliers, 9 were objective 1 regions. From these, four were growth miracles and five were growth disasters.

4.Concluding remarks

This paper tests the convergence hypothesis across EU regions. The method consists in estimating regressions that relate economic growth to the initial income and other variables. We control for the quality of national institutions and test whether the status of "objective 1" region improves the estimated speed of convergence.

What our estimation suggests is that, after the reform of the European regional policy, output per working-age person in the poorest regions has exhibited, on average, a tendency to grow faster than in the richer regions. This result is not necessarily in contradiction with the recent evidence that points to no convergence among EU regions, given that our analysis applies to a different period.

Our estimation results improve significantly when differences in balanced growth paths are allowed for by adding a variable that accounts for the role of national institutions. The low explanatory power of the regression equation suggests, however, that region-specific factors are important for explaining regional disparities. Assessing the residuals of the regression equation, we obtain "the measure of our ignorance" in this regard. Eligibility for objective 1 does not appear to constitute by itself an advantage for poorer regions.

National and regional governance, rather than eligibility for Community support, seem thus to be important factors in explaining economic growth.
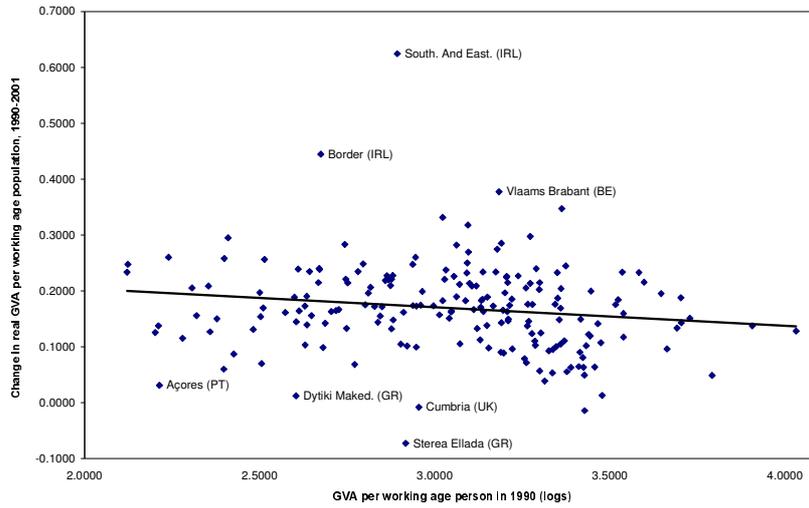
Figure 1

Growth in Q/A versus growth in A/N (1990-2001, deviations from the EU rate)
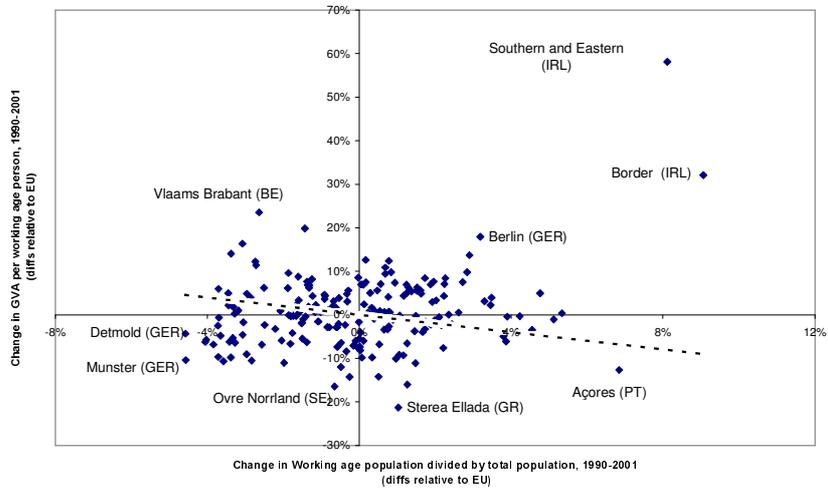
Source: Own calculations using data from the European Commission, DGREGIO, June 2003.

Figure 2

Growth rates versus initial levels, GVA per working age population, 1990-2001

Source: Same as Figure 1.

Table 1

Regression variables explaining growth between 1990 and 2001

	1	2	3
constant	0.2729	0.2229	0.3535
	5.97	*5.14*	*4.19*
log(Q/A), 1990	-0.0339	-0.0479	-0.0700
	-2.28	*2.64*	*-3.20*
National Institutions		0.0100	0.0040
		1.67	*0.59*
Irish Dummy		0.3618	0.3690
		7.32	*7.27*
Dummy "objective 1"			-0.1669
			-1.23
[Dummy "Objective 1"] * [log(Q/A),1990]			0.0509
			1.04
R^2 adjusted	0.021	0.235	0.240
N	196	196	196

Note: t-ratios in italic.

Figure 3

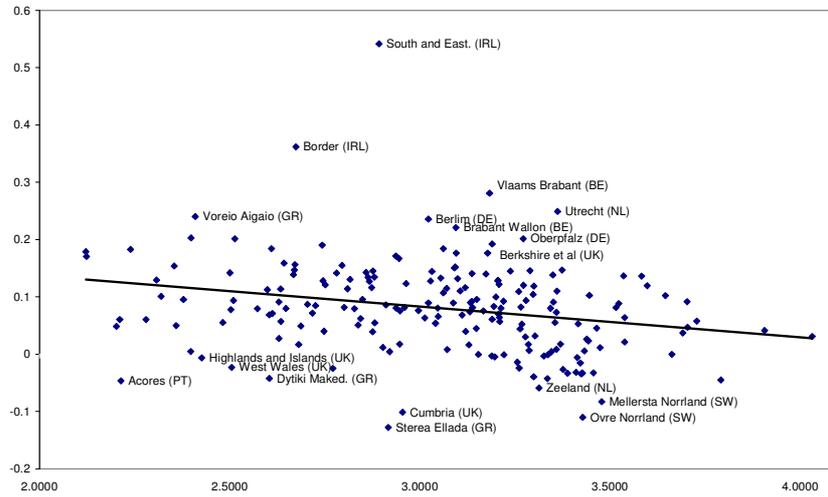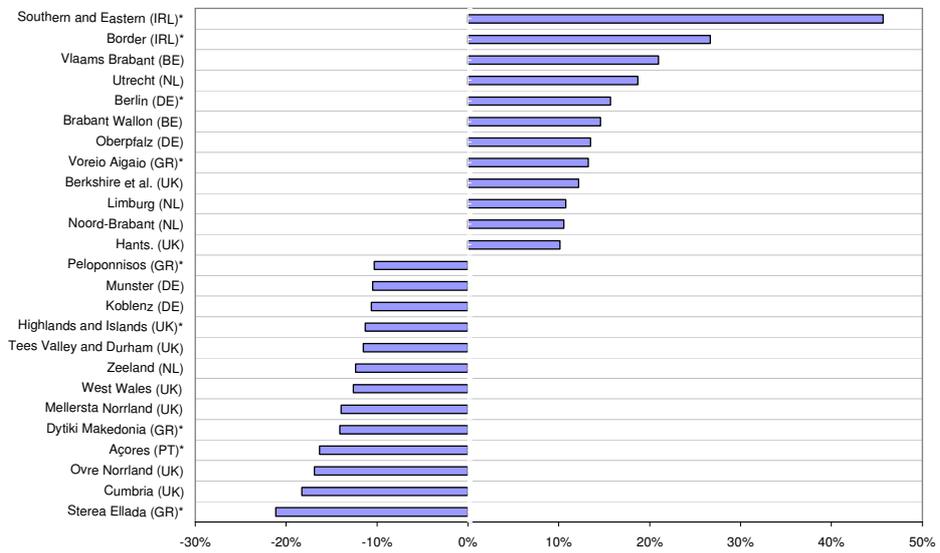**Partial association between growth and initial level of GVA per working age population, 1990-2001**

Figure 4

Miracles and Disasters

Notes: The figure plots the vertical distance between the position of each country in Figure 3 and the regression line. Regions under Objective 1 appear with a sign (*).