38TH CONGRESS EUROPEAN REGIONAL SCIENCE ASSOCIATION

ECONOMIC GROWTH AND EMPLOYMENT: REGIONAL DISPARITIES IN THE EU

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Abstract.

One of the main problems of the European countries is their small capacity to generate employment. This is an important point because of the social and human problems that it produces, which are more serious in the case of peripheral regions.

In this paper, we make a comparative analysis of employment and economic growth among the main EU countries. We study the reason of the more reduced rates of employment in several EU countries. Then, we analyse the generation of emplyment in the European regions, specially in the peripheral ones which are the most affected by unemployment.

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1. INTRODUCTION.

As it is profusely stated, unemployment is one of the main problems in most of the regions of Europe. Looking at employment instead of at unemployment, we realise that there is an enormous diversity of employment rates in Europe at regional level linked to great differences in the level of production per head.

Observing in detail the current heterogeneity in GDP per head in the EU regions we easily realise that some part of the gap is due to productivity diferentials but an important part is due to the differentials in the employment and participation rates. The latter may make us concious, once again, that in order to increment employment is necesary to reach a lasting and vigorous rate of growth of income per head mainly in the peripherical regions.

It is also noticeable that production structures around Europe, even within countries, are extremelly heterogeneous, and for this reason productivity gaps must be seen cautiously in order to distinguish differentials in productivity from differentials in economical structures.

In order to test whether or not there is convergence in the regions of Europe, first of all, we will analyse the temporal evolution of the dispersion in the components of income per head, i.e. average productivity and employment and participation rates. Secondly, we will study whether poor economies grow faster than the richer ones, or not. Although, some authors prefer the utilization of one criterium of convergence over the other, we consider that both can give us a good insight in the dynamics of growth in the set of the regions considered.

Any way, the key point is to shed light over the issue of whether the process of politic integration in the EU will mitigate or exhacerbate regional disparities. In each case, there would be an argument in favour of accelerating or not the integration process. Despite the results of the analysis, we have to bear in mind that the data set is refered to past data (1980-1995) and many of the policies may have had not enough time to operate.

Sala-i-Martin (1993) makes some excellent comments on a literature survey of empirical

models applied to regional data of USA, Japan, U.K., France, Germany, Spain Italy and Canada. In every case analysed regional convergence was found in both senses mentioned above, using both panel data and a long run sample.

Dewhurs and Mutis-Gaitan (1995) concluded that over the period 1983-1991 the EU regions were converging to a common equilibrium growth rate but at varying speeds, which were heavily dependent on national economic performance.

Armstrong (1995) clearly states his conclusion that evidence support GDP per capita convergence among the EU regions, and not the highly undesirable formation of separate converging clubs between core and peripherical regions. He also pointed that neoclassical convergence mechanisms seemed to work more slowly during recessions and periods of high unemployment.

2. DATA.

Several issues of the Statistical Yearbook of the Regions and Statistics in Brief have been the main data source. Other source has been OECD National Accounts Vol. 1.

Both employment and GDP regional data have been broken down following the Eurostat R6 classification, which comprises the following branches:

R1: Agriculture, forestry and fishing products.
R2: Energy: fuel and power products.
R3: Industry: industrial products.
R4: Construction: building and construction.
R5: Market services: allservices but those included in R6.
R6: Non-market services: mainly services financed by public budgets like Public
Administration, Public Health and Education. Eurostat includes domestic services in this group.

Missing data and political changes in Europe aroused a considerable amount of extra

work for the completion of series. Unfortunately, it was impossible to obtain figures for the eastern landers of Germany, and the regions of Austria, Finland and Sweden, which would have shed light over this study. It was also impossible to obtain regional GDP data al R6 level of desgreggation for 1995.

The use of some discontinuous points at time will let us analyse the period whole period between 1980 and 1995, although it is undoubted that the use of annual data would allow us to better check the precise variations in the main variables considered acroos time

GDP data are expresed in 1990$ using exchange rates of 1990. The utilization of either exchange rates or purchasing power parities does not make a significant difference as far as in this year the international financial markets had a very quite climate. The price indexes used to express the sectoral GDP of the regions in 1990 currencies have been the corresponding national GDP deflactors, lacking of more accurate price indexes for regions and branches of activity.

Scarcity of available data have severely confined our study both from a geographic point of view and also from a sectorial perspective. It would be highly desirable that Eurostat made an effort in offering a more desaggregated, comprehensive and updated set of regional statistics in order to allow a deeper research in this field which may enable us to understand and prompltly answer to regional issues.

3. METHODOLOGY.

First of all, we analyse the differences in GDP per head among the European regions. In this connection, we will make a decomposition of regional GDP per head is in the following three components: average productivity, employment and participation rates:

(1) $(GDP_i/POB_i) = (GDP_i/L_i) \, (L_i/PA_i) \, (PA_i/POB_i)$

This equality also is valid for Europe as a whole.

(2) $(GDP_{eu}/POB_{eu}) = (GDP_{eu}/L_{eu})\ (L_{eu}/PA_{eu})\ (PA_{eu}/POB_{eu})$

Aplying logarithms and substracting (2) from (1) we obtain:

$\ln(GDP_i/POB_i) - \ln(GDP_{eu}/POB_{eu}) = \ln(GDP_i/L_i) - \ln(GDP_{eu}/L_{eu}) + \ln(L_{eu}/PA_{eu}) - \ln(L_i/PA_i)$

$+ \ln(PA_{eu}/POB_{eu}) - \ln(PA_i/POB_i)$

This decomposition is crucial since it will let us know which part of the diferences in GDP per head are due to significant productivity gaps or to significant differences in the employment or participation rates.

It is also possible to establish a decomposition of differences in average productivity in that part due to different sectoral average productivities and the part due to differences in production structure:

$$(GDP_i\ /L_i)\ =\ \sum_{j=1}^{n} (L_{ji}\ /L_i)\ (GDP_{ji}/\ L_{ij})$$

$$(GDP_{eu}\ /L_{eu})\ =\ \sum_{j=1}^{n} (L_{jeu}\ /L_{eu})\ (GDP_{jeu}/\ L_{jeu})$$

$$(GDP_i\ /L_i) - (GDP_{eu}\ /L_{eu})\ =\ \sum_{j=1}^{n} (L_{jeu}\ /L_{eu})\ [(GDP_{ji}/\ L_{ji}) - (GDP_{jeu}/\ L_{jeu})]\ +\ \sum_{j=1}^{n} (GDP_{jeu}/\ L_{jeu}))[(L_{ji}\ /L_i) - (L_{jeu}$$

The first factor in the equality above refers to the differences due to sectoral productivities and the second to the differences due to production structure.

Secondly, we also study the *sigma* convergence in GDP per head from this same perspective: the standard deviation of the logarithm of GDP per head is equal to the standard deviation of the logarithm of average productivity plus the standard deviation of the logarithm of the two previously described components of the employment and participation rates.

Thirdly, we will analyse *beta* convergence. This concept is based in the assesment that the growth of productivity is related to the productivity gap between present productivity and his steady state value. The relevant equation to be estimated within this framework is as follows:

$$1/T \ln (Y_{it}/Y_{it-T}) = a + \ln(Y_{it-T})\ 1/\ (\exp(\beta T)T)$$

This beta convergence criterium may be conditioned by the introduction of national dummies and agriculture share in employment in order to account for diversities in the endowment of factors of production and in sectoral structures. In fact, this is an attempt of utilization of the conditional convergence concept, bearing in mind the extraordinary difficulty of higher improvements in this area with the shortage of avalaible data that exists.

4. DISPARITIES IN GDP PER HEAD AMONG THE EU REGIONS.

GDP per head is problaby the most important indicator for the welfare of the regions, first of all, because it is decisive for domestic economic well-being and, secondly, because it is highly correlated with other important aspects of well-being that affect to individuals of any community (labour, social or public well-being), GUISAN Y FRIAS (1997).

As we will observe below, GDP per head is deeply related to employment, not only, since the point of view of the employment rate but also from the standpoint of the participation rate. The GDP per head differences among the EU regions are highly related to GDP per head differences among the countries: the regions of Germany, BENELUX, Denmark and France being over the average of the EU regions (18,169 1990 USA$/inhabitant), the regions of the United Kingdom and the Republic of Ireland around this average and Spanish, Portuguese and Greck regions clearly below.

It must be also pointed out that there is an enormous gap between the regions of the North and South of Italy. The former have a level of GDP per head over the EU standard whereas the latter are considerably below. It is also noticeable the existing gap among the regions of Spain, some of them almost reach the EU standard whereas other are notoriously below. As Sala-i-

Martin (1994) has shown the ranking of the 5 biggest economies of Europe in dispersion in GDP per head among their regions was between 1950 and 1990 in decreasing order: Italy, Spain, Germany, France and the UK. According to our calculations this ranking remains for 1995, except for Germany that has surpassed Spain, being the corresponding coeficients of variation: 25.95%, 19.20%, 23.26%, 15.77% and 10.80%, respectively.

Graph1. GDP PER HEAD IN THE REGIONS OF THE EUROPEAN UNION
AND ITS MEAN VALUE
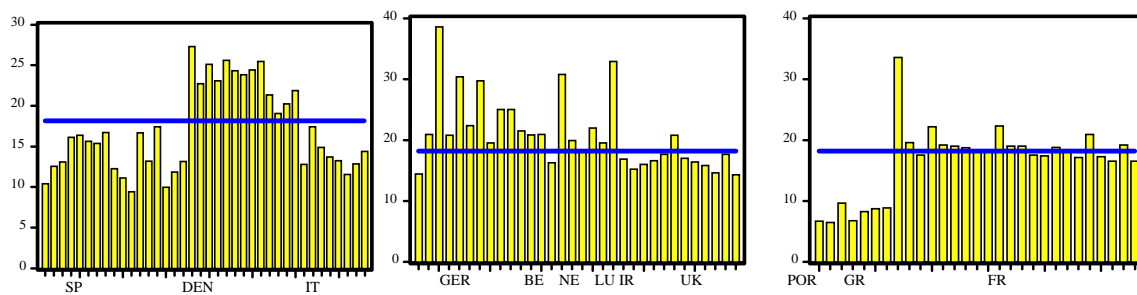
The diferences in average productivity of labour are the main factor to explain the GDP per head differences in Europe. The standard deviation of this variable in a range of 98 European regions was in 1995 equal to 13.36, with a coeficient of variation of 27.46%. The minimum average productivity corresponded to Centro de Portugal (13.41 thousands of 1990$ per employee) and the maximum to Bruxelles (91.76 thousands of 1990$ per employee).
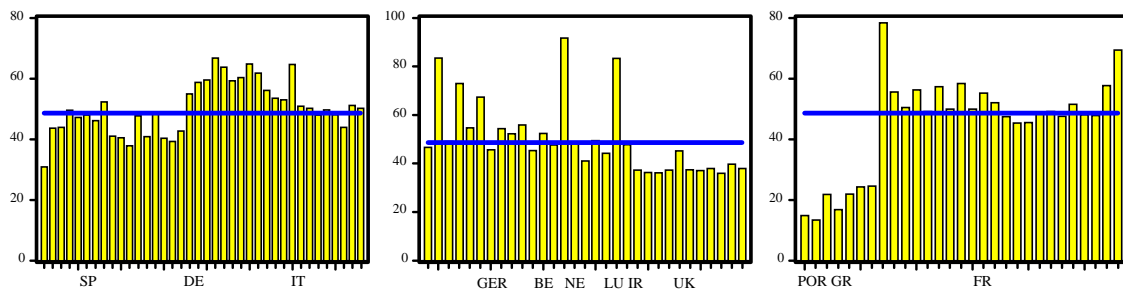
The unemployment rates in the regions of Europe range between 33.26% in Andalusia to 3% in Luxembourg. In spite of this fact, dispersion in the activity rate may be not as big as this former data shows, the standard deviation was 0.06265 and the coeficient of variation 7%. All the Spanish regions, the regions of the south of Italy, Belgium and Nord Pas de Calais and the Mediterranean French regions are those where unemployment is more severe with unemployment rates over the European regional mean (12.04%). On the other hand, Denmark, Northern Italy, Germany (except Berlin), UK (except Northern Ireland), Portugal and Greece are those countries with privileged regions whose unemployment rates are below the EU mean (10.63%). In this last group the are also some French regions: Bretagne, Pays de la Loire, Basse Normandie, Centre,

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Limousin, Frech comte and Alsace.

The activity rates range from 0.28% in Corse to 0.53% in Denmark, being the standard deviation 0.048390 and the variation coeficient 11.42%. Theafore, it can be stated that there are important diferences in this variable around Europe. All the regions in Spain, Italy and Greece, most of the French and Belgian regions, Luxembourg, Ireland and Saarland and Northern Ireland have activity rates under the European regional mean (0.42%). On the contrary, Denmark, German, Dutch, British and Portuguese regions and Haute-Normandie, Pays de la Loire, Aquitanie, Rhöne-Alps have activity rates well over the European mean (0.44%)

In the following graphs are presented the average productivity, the percentage of population in the labour force and the percentage of the labour force employed in the regions of the EU in 1995.

Graph2. AVERAGE PRODUCTIVITY IN THE REGIONS OF THE EUROPEAN UNION AND ITS MEAN VALUE

Graph3. ACTIVITY RATES IN THE REGIONS OF THE EUROPEAN UNION
AND ITS MEAN VALUE
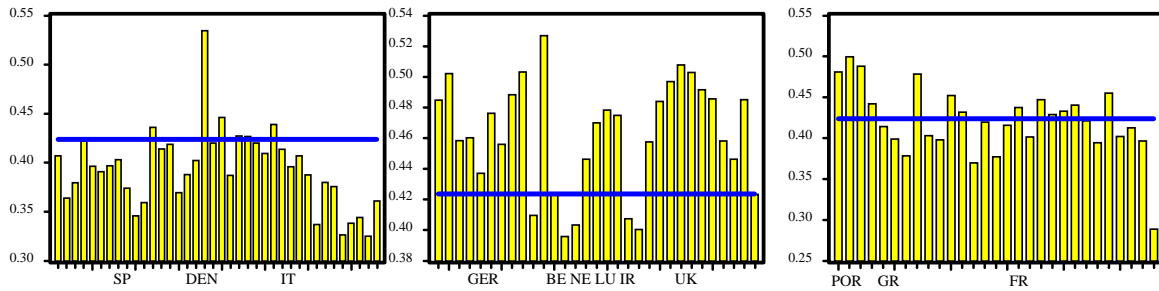
Graph4. EMPLOYMENT RATES IN THE REGIONS OF THE EUROPEAN UNION
AND ITS MEAN VALUE
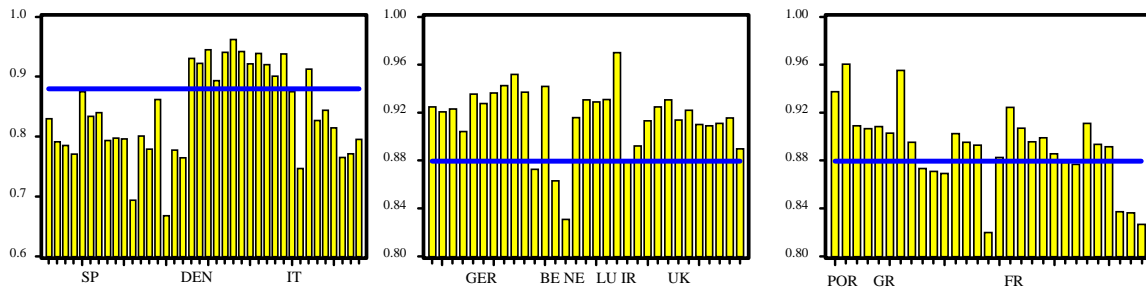
As it is shown in the scatter diagram, there is a very high correlation between GDP per head and average productivity (0.86), i.e. those regions with higher labour productivity are also those with a higher level of production. However, correlations of Gdp per inhabitant with the rate of employment (0.45) and the rate of activity (0.36) are considerably less important. Graph5.
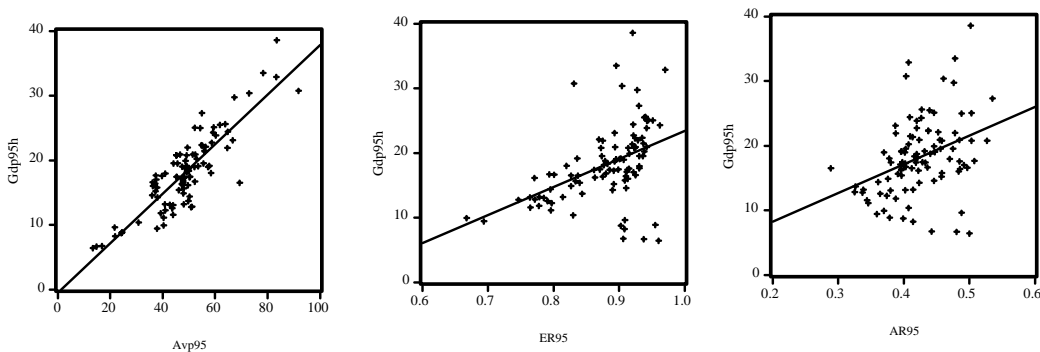
As it was previously stated, we will proceed making the decomposition of the gap in average productivity in the part explained by the productivity differential of the sectors and the part explained by the production structure. The availability of sectoral GDP data made us to develop this analysis for year 1990. The comparisons have been made with the EU shares of employment in the sectors, (agriculture (6.7%), energy (1.4%), manufacturing (23.29%), construction (7.18%), market services (41.13%) and non-market services (20.26%)), and with their respective average productivity in thousands of 1990$ per employee (agriculture (20.82), energy (147.32), manufacturing (47.20), construction (37.74), market services (53.45) and non-market services (32.56)).

Graph6. DECOMPOSITION OF THE GAP IN AVERAGE PRODUCTIVITY, IN THE
PART EXPLAINED BY THE PRODUCTIVITY DIFERENTIAL OF THE SECTORS AND
THE PART EXPLAINED BY THE PRODUCTION STRUCTURE (1990).
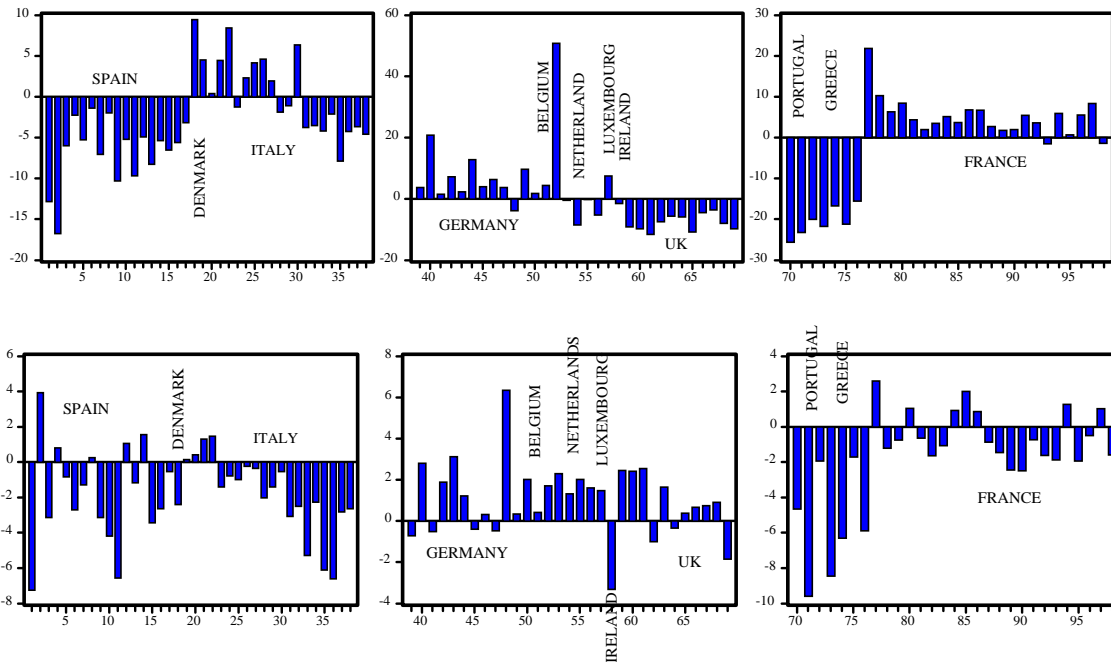
Average productivity in the regions of Spain, Sothern Italy, Ireland, Portugal and Greece is under European average mainly because of the diferentials of productivity between the branches of activity in Spain, Sothern Italy, Ireland, Portugal and Greece and the EU. However, whereas in a few of the Spanish regions (Asturias, País Vasco, Madrid, Cataluña y Baleares) the production structure lessen this gap, in every region of the South of Italy, Ireland, Portugal and Greece this gap is reinforced by the production structure. On the other hand, Luxembourg, the regions of Belgium and most of the German ones have positive gaps in both component of productivity which finally means that all of them exhibit a positive labour productivity differential.

Brithish regions also exhibit a sort of regular pattern in this subject, all of the regions have a sectoral productivity under European average, but most of them have a privileged production structure (except East Anglia, South West and Norther Ireland) which in no case is enough to compensate the labour productivity gap. On the contrary, all of the regions of France have a

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sectoral productivity over European average (except Limousin and Corse). Despite the fact that structure differentials are less uniform in France, only Bretagne, Poitou-Chanteres and Auvergne have their productivity differentials reversed and are with those regions above mentioned that French regions under the European average productivity value.

The regions of Northern Italy have both component of labour productivity well over or slightly below the European average. In fact, only Trentino-Alto Adige has a negative differential with the European mean. The sectorial diferential compensates for the structural gap in Denmark, whilst in The Netherlands compensation works in the other way round, although is not enough for Ost Nederland and Zuid Nederland.

5. CONVERGENCE OR DIVERGENCE IN THE REGIONS OF THE EU.

In order to shed some light over the evolution of inequalities in income and employment in the European regions between 1975 and 1995, we will proceed showing the results of some calculations made according to the convergence criteria that have been stated above. In all of them we have used population as a basic element of the comparisons, for this reason the variables are expressed in *per capita* terms. Whenever there were data available for the whole period we used them, otherwise we constrain the period according to data.

5.1 CONVERGENCE IN INCOME.

The global evolution followed by GDP per head was towards a disminution of the important diferences among the regions of Europe. This path was more moderate for the regions of the United Kingdom, Germany and Italy and quite consistent in Spain, France and the Netherlands. Belgium and Portugal have a big gap in GDP per head among their regions, on the contrary, this diferences are small for The Netherlands and Greece.

There was β convergence in GDP per head in every country and in Europe as a whole in the period 1975-1995. The regions of Spain and France had a steady evolution in all the subperiods considered. However, this evolution was discontinous in the other countries, there

was a break point in 1985 in The Netherlands and in 1990 in Italy, Belgium, United Kingdom and Portugal. In the last subperiod, 1990-1995, there was an intense thrust toward the reduction of the gap.

Table 1.

	COEFFICIENT OF VARIATION				
	1975	1980	1985	1990	1995
SPAIN	24.66	20.21	22.04	19.75	19.20
ITALY	26.37	29.36	25.13	26.21	25.95
GERMANY	23.38	22.62	23.48	22.89	23.26
BELGIUM	35.28	35.77	33.53	38.19	32.72
NETHERLANDS	16.70	18.28	25.48	9.64	8.31
UNITED KINGDOM	10.55	9.73	10.57	11.49	10.80
PORTUGAL			23.92	34.86	20.69
GREECE				3.77	3.75
FRANCE	21.58	16.24	17.27	18.72	15.77
EUROPEAN UNION	32.45	32.77	33.26	29.29	28.39

Table 2.

	β CONVERGENCE									
	1975-1980		1980-1985		1985-1990		1990-1995		1975-1995	
	b	R^2	b	R^2	b	R^2	b	R^2	b	R^2
SPAIN	-0.04	0.43	-0.03	0.08	-0.03	0.10	-0.01	0.08	-0.02	0.56
ITALY	0.00	0.01	-0.00	0.01	0.01	0.12	-0.00	0.03	-0.00	0.00
GERMANY	-0.00	0.14	0.00	0.06	-0.00	0.04	-0.01	0.02	-0.01	0.06
BELGIUM	0.00	0.37	-0.01	0.41	0.03	0.99	-0.03	0.84	-0.00	0.12
NETHERLANDS	0.02	0.42	0.06	0.65	-0.15	0.84	-0.03	0.95	-0.03	0.76
UNITED KINGDOM	-0.03	0.14	0.00	0.00	0.02	0.20	-0.04	0.18	-0.01	0.14
PORTUGAL					0.03	0.02	-0.08	0.81	-0.02*	0.29*
GREECE							-0.22	0.56	-0.22*	0.56*
FRANCE	-0.05	0.58	-0.01	0.02	-0.00	0.00	-0.02	0.11	-0.02	0.42
EU-12	-0.00	0.00	-0.00	0.02	-0.02	0.25	-0.01	0.08	-0.01	0.25
EU-12 with national dummies	-0.02	0.53	-0.01	0.15	-0.01	0.45	-0.01	0.35	-0.01	0.50

*Period 85-95 for Portugal and 90-95 for Greece.

5.2 CONVERGENCE IN EMPLOYMENT.

Non agrarian employment as a percentage of population grew in Europe from 35% in 1985 to 37% in 1995, being in 1990 slightly over this figure (38%). In general, non-agrarian employment per inhabitant grew in all the counties of Europe until 1990, decresing after that year in Spain, Italy and Luxembourg.

The coefficient of variation of the European regions as a whole followed a decreasing evolution, though with a shorter value in 1990 than in 1995. This evolution was also followed by the regions of Italy, Belgium and France. In the regions of Spain, Germany, the Netherlands and Portugal this trend towards the disminution of the gap was continuous, and in the British and Greek regions dispersion of employmen rates grew in 1990 and decreased in 1995.

Table 3.

	COEFFICIENT OF VARIATION				
	1975	1980	1985	1990	1995
SPAIN	21.3	16.60	16.78	16.28	15.47
ITALY		26.54	19.77	19.77	20.55
GERMANY		13.88	14.13	12.14	6.18
BELGIUM			10.10	5.88	9.10
NETHERLANDS			7.87	5.99	4.54
UNITED KINGDOM			9.32	9.80	7.26
PORTUGAL			16.64	15.63	10.01
GREECE			12.60	13.88	8.72
FRANCE		11.31	10.62	9.99	12.82
EUROPEAN UNION			22.79	18.63	19.88

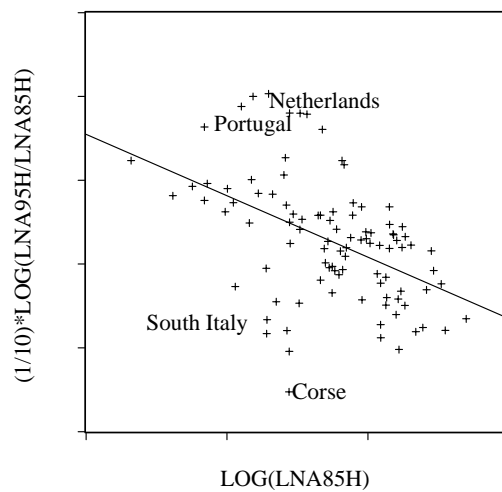As shown in the graph below, there is an inverse relation between the growth rate of non-agrarian employment per head and its initial value. However, the regions of The Netherlands and Portugal increase their quotients, non-agrarian employment/population, more than expected according to their starting values. On the contrary, the regions of the south of Italy and Corse underwent an evolution below expectations.

This same evidence of β convergence is achieved through the observation of the next table (only one out of 41 coeficients for the initial rate of non-agrarian employment is more than zero). As can be seen, there is convergence among the European regions whether or not we include national dummies and, which is more, there is also convergence within the countries, except for Italy and France (argument that is slightly reversed considering 1980 employment data).

Table 4.

	1975-1980		1980-1985		1985-1990		1990-1995		1985-1995	
	β CONVERGENCE									
	b	R²	*b*	R²	*b*	R²	*b*	R²	*b*	R²
SPAIN	-0.05	0.43	0.00	0.00	-0.02	0.09	-0.02	0.13	-0.02	0.20
ITALY			-0.10	0.38	-0.00	0.00	0.00	0.00	0.00	0.00
GERMANY			0.00	0.02	-0.03	0.32	-0.14	0.72	-0.08	0.79
BELGIUM					-0.19	0.73	0.10	0.85	-0.10	0.57
NETHERLANDS					-0.05	0.79	-0.05	0.91	-0.04	0.97
UNITED KINGDOM					0.00	0.08	-0.06	0.43	-0.02	0.35
PORTUGAL					-0.01	0.04	-0.07	0.95	-0.04	0.87
GREECE					0.00	0.00	-0.07	0.88	-0.03	0.88
FRANCE			-0.02	0.16	-0.02	0.16	0.00	0.00	0.00	0.00
EU-12			-0.02	0.05	-0.05	0.38	-0.00	0.00	-0.03	0.22
EU-12 with national dummies									-0.03	0.75

		1975-1995		1980-1985	
		b	R²	*b*	R²
SPAIN		-0.02	0.54		
ITALY				-0.00	0.04
GERMANY				-0.04	0.78
FRANCE				-0.00	0.00

Graph 7.

(1/10)*LOG(LNA95H/LNA85H)

Netherlands
Portugal
South Italy
+Corse

LOG(LNA85H)

6. CONCLUSIONS.

1.- GDP per head is deeply correlated to average productivity (0.86) and employment, not only, since the point of view of the employment rate (0.45) but also from the standpoint of the participation rate (0.36).

2.- As stated in conclusion one, most of the regions that exhibit a high GDP per head also exhibit high productivities, employment and activity rates. Nevertheless, in the less developed regions in Portugal, Greece and Spain, their low figures of GDP per inhabitant are related to low labour productivity, high employment rates and low participation rates, which is connected with the persistence of old production structures and over-employment in the primary sector activities.

3.- Differentials of productivity between the branches of activity in the regions and the EU are the main factor in explaining the labour productivity gaps. However, structural gaps are of crucial relevance in many cases in which they reverse or reinforce, totally or parcially, the direction of the other component.

4.- The GDP per head gap has disminished among the regions of Europe, more consistently in Spain, France and the Netherlands, an less in the United Kingdom, Germany and Italy. However, there are still significant disparities in GDP per head in Belgium, Italy, Germany, Portugal and Spain.

5.- There was β convergence in GDP per head in every country and in Europe as a whole in the period 1975-1995, with an intense thrust toward the reduction of the gap between 1990 and 1995.

6. There is an inverse relation between the growth rate of non-agrarian employment per head and its initial value, with the exception of the regions of The Netherlands, Portugal and the south of Italy. In this connection, we can state that there is β convergence among the European regions in their non-agrarian employment rates, both at national and European level.

7. Despite the shortness of the sample we conclude that the coefficient of variation of the non-agrarian employment per inhabitant in the European regions followed a decreasing evolution, both as a whole and within the countries, although with a non steady path.

1	Galicia	36	Calabria
2	Asturias	37	Sicilia
3	Cantabria	38	Sardegna
4	Pais Vasco	39	Scheleswig-Holstein
5	Navarra	40	Hamburg
6	Rioja	41	Niedersachsen
7	Aragón	42	Bremen
8	Madrid	43	Nordrhein-Westfalen
9	Castilla y León	44	Hessen
10	Castilla-La Mancha	45	Rheinland-Pfalz
11	Extremadura	46	Baden-Wüttenberg
12	Cataluña	47	Bayern
13	Comunidad Valenciana	48	Saarland
14	Baleares	49	Berlin
15	Andalucía	50	Vlaams Gewest
16	Murcia	51	Region Wallomme
17	Canarias	52	Bruxelles
18	Danmark	53	Noord-Nederland
19	Piemonte	54	Oost-Nederland
20	Valle d´Aosta	55	West-Nederland
21	Liguria	56	Zuid-Nederland
22	Lombardía	57	Luxembourg
23	Trentino-Alto Adige	58	Ireland
24	Veneto	59	North
25	Friuli-Venezia Giulia	60	Yorkshire and H.
26	Emilia Romagna	61	East Midlands
27	Toscana	62	East Anglia
28	Umbría	63	South-East
29	Marche	64	South-West
30	Lazio	65	West-Midlands
31	Campania	66	NorthWest
32	Abruzzi	67	Wales
33	Molise	68	Scotland
34	Puglia	69	NorthernIreland
35	Basilicata	70	Norte

71	Centro	85	Lorraine
72	Lisboa e V. Tejo	86	Alsace
73	Alentejo + Algarve	87	Franche-Comté
74	Voreia Ellada	88	Pays de la Loire
75	Kentriki Ellada	89	Bretagne
76	Anatolika Kai Notia Nisia	90	Poitou-Charentes
77	Ille-de-France	91	Aquitaine
78	Champagne-Ardenne	92	Midi-Pyrénées
79	Picardie	93	Limousin
80	Haute-Normandie	94	Rhöne-Alpes
81	Centre	95	Auvergne
82	Basse-Normandie	96	Languedoc-Rousillon
83	Bourgogne	97	Provence-Alpes-Côte d´Azur
84	Nord-Pas-de-Calais	98	Corse

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