

Rodil-Marzábal, Óscar

**Conference Paper**

## Competitiveness and regional growth in the European Union: unit labour costs disparities

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## 45<sup>th</sup> Congress of the European Regional Science Association

**Title:** Competitiveness and regional growth in the European Union: Disparities in unit labour costs<sup>1</sup>

**Author:** Óscar Rodil-Marzábal, Dep. of Applied Economics, University of Santiago de Compostela

**Address:** Facultade de Ciencias Económicas, Avda. do Burgo s/n 15782 Santiago de Compostela (Spain)

**E-mail:** eaglidor@usc.es

### **Abstract:**

This paper aims at analysing the relation between competitiveness and economic growth for the period 1995-2000 (2002 for some variables). To this aim we analyse the evolution of the unit labour cost by sector ('traded' and 'non-traded' sector) and decomposition between the unit labour requirement and the unit price of labour. Results show the existence of high regional disparities, varying with the sector. We also find diverse combinations in productivity and unit price of labour terms, leading to the existence of different competitive strategies. Finally, we can find some evidence of a particular relation between the different patterns of competitiveness and regional economic growth.

**Keywords:** unit labour cost, productivity, wages, competitiveness, economic growth, European regions

**JEL codes:** R11, J30, O41

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## ***1. Introduction***

The debate on growth and economic convergence has been a central subject of the economic Literature during recent years. This subject especially refers to the debate on the European regional context. The regional data availability carried out by the creation and update of Eurostat's REGIO data base is one of the factors promoting this debate.

On the other hand it is necessary to highlight remarkable advances in the theories of the economic growth. We particularly refer to the advances in endogenous growth theories (Arrow, Romer, Lucas,...) and other perspectives (Dosi, Soete, Fagerberg,...) at explaining the process of Economic Growth. Human capital, technological capacity, regional systems of innovation or public policies are some of the factors that contribute to these explanatory models. Results logically differ from each other because of geographic differences, different temporal extent or even different sources and analytical methods.

We can observe however a certain consensus related to the variability of the regional growth process in Europe. In fact, many empirical works agrees in identifying a clear process of regional convergence in Europe from sixties to early eighties (Barro and Sala-i-Martin, 1995; Armstrong and Vickerman, 1995; Button and Pentecost, 1999;...). This result indicates in fact that poor regions have grown more than the rich ones. Only a few works however include all European Community regions, because of statistical restrictions and other reasons (some contributions exclude, for example, the regions from the Mediterranean countries). Out of these limitations, these results are partly coherent with the conventional explanation related to the Solow's model that predicts the convergence of income due to the validity of the decreasing returns assumption. Nevertheless, we can also observe a consensus concerning the slow down and stop of this convergence process in early eighties. Since that time, some authors (Armstrong and Vickerman, 1995; Button and Pentecost, 1999;...) observe a divergent behaviour of European regions.

The analysis of factors explaining this change (technological gap, human capital endowment, regional systems of innovation, spatial effects of public policies...) constitute the subject matter of many recent works. The aim of this paper however is to study the competitiveness and its effects on the regional disparities; which has not been analysed enough to obtain definitive results. On the other hand, the notion of competitiveness that we used here refers fundamentally to an intra-sectoral advantage of production costs (unit labour costs) in the classic sense of absolute advantage. In addition we divide competitiveness (unit labour costs) into two factors: the unit labour requirement and the unit price of labour. Finally, we focus in this paper on the relation between the economic growth and the regional competitiveness (measured by the unit labour cost). Results question, among others, the validity of the so-called "Kaldor paradox" in the European regional context.

The research for this paper includes 116 regions<sup>2</sup> from EU-15 and for the period 1995-2000 (2002 for some variables). Two main reasons explain this. First, because all these

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<sup>2</sup> The sample of regions involved in this empirical analysis correspond to the following levels of desegregation in agreement with nomenclature NUTS (Eurostat): Nuts 0 (Denmark and Luxembourg), Nuts 1 (Austria, Belgium, Germany, Portugal, Greece, Holland, Finland and United Kingdom), Nuts 2 (Spain, France, Italy, Ireland and Sweden). The Spanish regions of Ceuta and Melilla, the France's

countries shared the European integration process during this period (the previous enlargement was in 1995). Second, we cannot obtain more recent data for all the regions because of statistical limitations.

## ***2. Competitiveness and economic growth: two connected realities.***

The aim of this paper is to study the regional competitiveness and its implications in economic growth terms. A common idea about competitiveness is that the most competitive economies tend to grow faster than the less competitive ones. In fact, in many modern economies the external demand growth has significantly contributed to the growth of the economies as a whole. But, what is understood by competitiveness?

The meaning of this term has been discussed in countless works, but it still looks confusing. This confusion derives from the attempt to extend the concept of "enterprise competitiveness" into the economies as a whole, understanding the first concept like the capacity to compete in the markets, maintaining or increasing the market share. In the enterprise scope, a company is competitive when it obtains profits from the market thanks to its capacity to produce goods that are demanded in the market at costs and prices lower than that of the rival companies. On the contrary, if a company is not competitive either by a high production costs-prices or by other factors (low quality, for example) run the risk of obtaining losses and being eliminated from the market. The notion of competitiveness acquires a less clear meaning in the context of the economies. The reason is that the economies cannot be eliminated because of its more or less competitive level. Although the effectiveness of their results can be evaluated, we cannot exactly apply the profit-loss concept of the enterprise into the context of the economies as a whole (F. Pérez, 2004).

Many authors treat competitiveness without distinguishing between the concept of the "enterprise competitiveness" and the competitiveness of economies. In this sense, they focus on the capacity of the economies to maintain or increase their market share. This meaning connects with the notion of "external competitiveness" indicated by Balassa (1964) that refers essentially to the success in the international markets. Not all the economies, however, give the same relevance to the external markets depending on their size and degree of opening<sup>3</sup>.

Some others focus on the success in the market and capacity to maintain or increase the standards of living (employment and income levels). This last meaning refers to the definition of competitiveness given by the European Commission (European Commission, 2002-2004). These authors understand competitiveness as the capability to increase the real income and the standard of living of economies, offering employment for who demand it. This second meaning, called "aggregated competitiveness", can be considered broader than the previous one and a more complete measurement of the competitive level.

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overseas territories and the British region of North West (including Merseyside) are excluded by statistical limitations.

<sup>3</sup> The weight of external markets is, in general, inversely proportional to the size of the economies. In fact, the greatest economies are more centred on its internal market. The opposite happens to the economies of reduced size, as it is the case of the small countries and regions, that depend to a great extent on the external markets.

Many authors either from one or another perspective agree in perceiving the productivity as the main source of competitiveness since it makes compatible the success in the market with a high standard of living.

This paper, however, focuses strictly on the unit labour cost, which determines the prices of products offered in the market. Nevertheless, we also consider the labour productivity and the unit price of labour that are factors determining the unit labour cost, in agreement with the following identity:

$$ULC = ULR \times UPL$$

In agreement with this identity, the Unit Labour Cost of product (ULC) can be calculated by the product of the Unit Labour Requirement (ULR) that is the inverse of the labour productivity, and the Unit Price of Labour (UPL). In such a way, a lower Unit Labour Requirement (higher labour productivity) determines a lower Unit Labour Cost and, therefore, a higher competitiveness (price). In the same way, a lower Unit price of Labour determines a higher competitiveness (low prices).

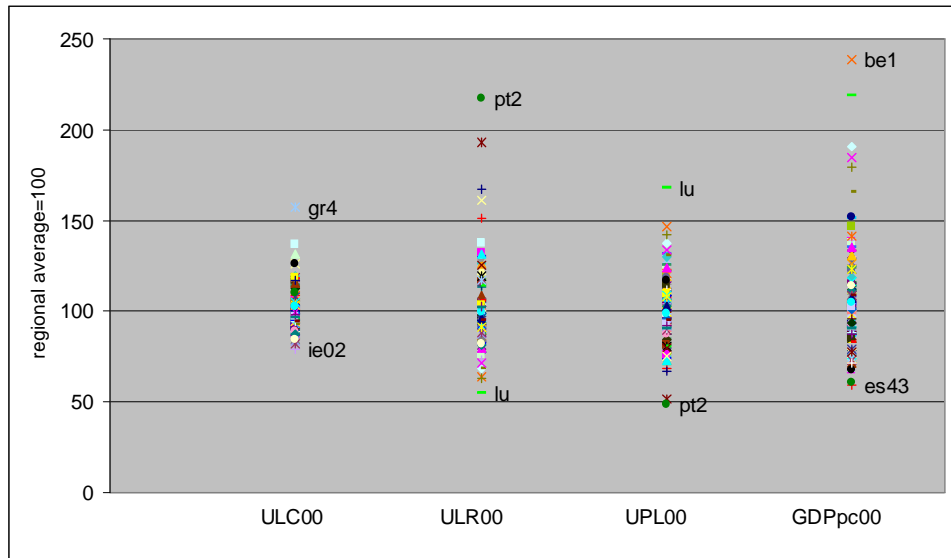
We focus here on the notion of competitiveness as an absolute advantage, which differs substantially from the comparative advantage perspective, so emphasized by the neoclassic authors (Heckscher-Ohlin model, for example). In agreement with the notion of the absolute advantage, the higher (lower) competitiveness of the economies refers to an advantage (disadvantage) in unit costs of production in front of other economies and it is, by definition, an advantage in intra-sectoral costs.

### ***3. Regional disparities in unit labour cost, unit labour requirement and unit price of labour.***

The estimation of unit labour cost data and its factorial decomposition allows us to obtain a first picture of the existing regional disparities. The ratios have been calculated respect to the average of these variables (value 100 in such a way that corresponds with the average value of the sample of regions).

A first comparison among these variables (ULC, ULR and UPL) allow us to conclude that the disparities of the respective distributions are very important. This is especially clear in the case of Unit Labour Requirement in which the positions oscillate between 51% (respect to the average) of Luxembourg and 224% of Azores (pt2). Comparatively, this variable (ULR) shows the highest disparities (51-224). This fact, however, is mainly due to the very low productivity of the less developed regions, whereas the Unit Labour Cost shows the lowest level of interregional differences (79-157). On the other hand, the Unit Price of Labour presents an upper middle level of disparities (49-168). In contrast, the relative distribution of the GDP per capita (euros) also show a higher level of disparities (45-250) than the three indicated variables.

**Figure 1: Regional disparities in Unit Labour Cost, Unit Labour Requirement and Unit Price of Labour (2000)**



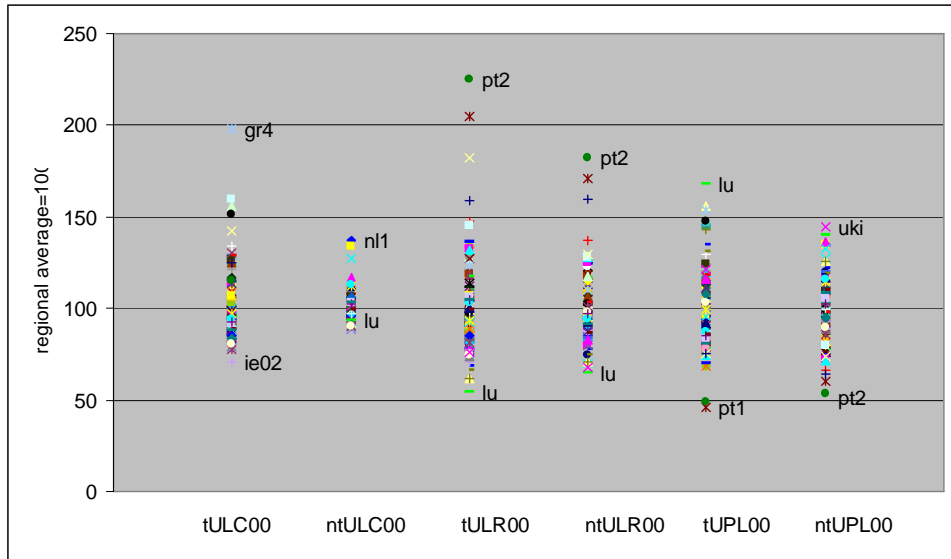
ULC: Unit Labour Cost, ULR: Unit Labour Requirement, UPL: Unit Price of Labour

Source: Own computation based on the Eurostat's REGIO data base.

The competitive force of the market makes the economies setting the prices of products in agreement with the parameters of the global market. Because of this reason, we can understand the lower level of disparities in the unit labour cost distribution. We also must remember that, even in the case of the less conventional products, the price is a major competitive factor. This fact should be even more clear in the European market in which predominates the intra-industrial trade. On the other hand, the Unit Labour Requirement, which is the inverse of labour productivity, it is characterised by high disparities because this variable depends on dynamic factors, with a strong systemic and cumulative character. One of these factors is, for example, the different regional technological capabilities. These different capabilities are the result of a cumulative process that depends on the diverse regional/national systems of innovation, generating strong differences in the growth of productivity.

A second comparison is the differentiation between two great sectors: the 'traded' activities and the 'non-traded' activities. In this sense, a higher level of disparities in the case of 'traded' activities is observed, being thus for the three variables. This fact shows the higher wage and productive variability present in the most dynamic and less protected sector of the economies.

**Figure 2: 'Traded' and 'non-traded' activities: regional disparities (2000)**

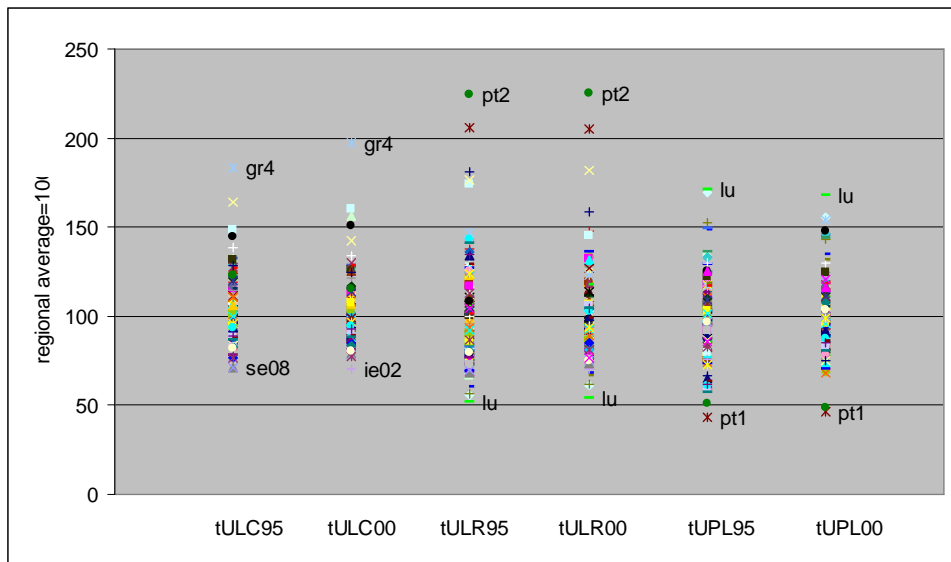


ULC: Unit Labour Cost, ULR: Unit Labour Requirement, UPL: Unit Price of Labour, symbol “t” before the variable refers to ‘traded’ activities, symbol “nt” refers to ‘non-traded’ activities

Source: Own computation based on the Eurostat's REGIO data base.

Finally, from a temporary perspective (1995-2000), a slight reduction of the regional disparities is observed in all variables, although these continue in a very high level.

**Figure 3: Evolution of regional disparities 1995-2000**



ULC: Unit Labour Cost, ULR: Unit Labour Requirement, UPL: Unit Price of Labour, symbol “t” before the variable refers to ‘traded’ activities, symbol “nt” refers to ‘non-traded’ activities

Source: Own computation based on the Eurostat's REGIO data base.

#### ***4. Unit Labour Cost evolution and its factorial decomposition.***

The analysis of the regional competitiveness from this perspective let us to consider the compared evolution of the unit labour cost (ULC) and their two determining factors: the unit labour requirement (ULR) and the unit price of labour (UPL).

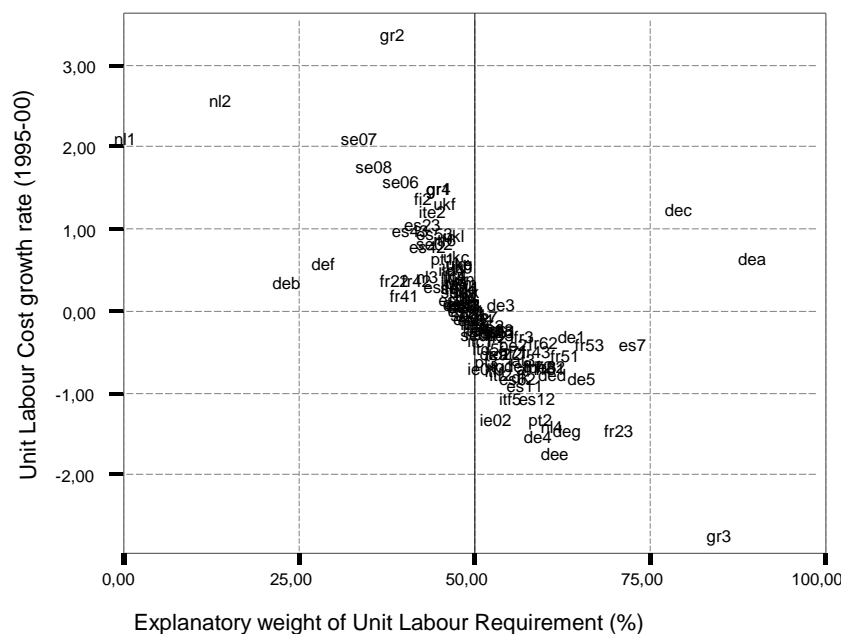
Logically the competitive strategies of the different regions are diverse, of such form that a same tendency in terms of unit labour cost can be accompanied by different behaviours in the evolution of productivity and wages. We accept that it is not equal of desirable a competitive improvement (reduction of the unit labour cost) based in an improvement of the productivity that allow to maintain or even to increase wages and the level of income of an important part of the population, with its positive impact on the GDP per capita, that other competitive improvement based in the wage containment and not in the improvement of the productive efficiency. This last strategy is own of economies with productive structures based on conventional or mature sectors although also on relatively protected sectors. For that reason, we consider oportune to establish distinctions based on the different competitive strategy of regions. This will allow us to identify the effects of these strategies on the economic growth and, therefore, its impact on the regional convergence in Europe.

The analysis of the evolution of the unit labour cost shows that only 60 of the 116 considered regions have improved their competitive level by the reduction of the unit labour cost. This set of regions is apparently characterized by a great heterogeneity, without clear neither national nor economic component (there are regions from all the countries and different economic level). In general, the main explanatory factor is the productivity, compensating in many of the regions strong increases of wages (case of some British regions and the two Irish). On the other hand, a strong and positive correlation between both variables (productivity and wages) is observed. This result shows that the most productive economies are also the economies with the highest growth of wages. In 12 of these 60 regions that have reduced the unit labour cost, the growth of productivity and wages exceeds annual 5%. In any case, most remaining regions of this group present a very low growth of productivity. In fact, in all of them the productivity is the main explanatory factor of the unit labour cost variation because of wage containment.

Regarding the 56 regions that have not reduced the unit labour cost, it is possible to also emphasize the absence of a homogenous characteristic profile, finding regions of very different economic level and geographic origin. The main explanatory factor is, unlike the previous group and with the exception of some (German) regions, the unit price of labour. Nevertheless, a high number of these regions (23) have experienced a strong growth of the productivity, although it has not enough to compensate the higher growth of the wages. This is the case of many British, Greek, Italian and Swedish regions.



**Figure 4: Unit labour cost and explanatory weight of labour productivity (1995-00)**



Source: Own computation based on the Eurostat's REGIO data base.

On the other hand, it is possible to emphasize the strong correlation (0,9) that exists between the evolution of the unit labour cost of total product and the evolution of the unit labour cost of the traded product. This fact contrasts with the lower correlation with the evolution of the unit labour cost of the ‘non-traded’ activities (0,2). This result shows the relevance of ‘traded’ activities that explain the dynamism of the economies, acting like main determinant of the wages and productivity distribution.

### ***5. Regional competitiveness in the less protected sector of the economy: level and evolution.***

We part from the idea that the unit labour cost is a good approximation to the unit cost of product. Thus, we can establish a classification of the European regions in agreement with the higher or lower level of competitiveness. For it we took like reference the level of unit labour cost for the traded sector in the year 2000<sup>4</sup> and its evolution for the period 1995-2000. This way, we can identify the (less) more competitive regions and those that reduced (increased) their level of unit labour costs in this period. In addition, those regions that have happened to be more competitive to be it less, or vice versa, are indicated in the picture with an asterisk (\*).

<sup>4</sup> We chose year 2000 because it is the most recent year of the period that is analyzed in this work, reflecting the present competitive situation.

We have chosen the sector that includes all of the ‘traded’ activities because it is the less protected sector of the economy and, therefore, the more exposed one to the external competition. Because of this fact it’s a especially sensible sector to the intra-sectoral differences of cost between the European regions. Logically, we would prefer to consider this sector of more desegregated form to capture these advantages of intra-sectoral cost more accurately. Nevertheless, this is not possible because of statistical restrictions. Therefore, this analysis should be to considered like a preliminary approach, in which some hypotheses on the existing relation between the competitive level and regional dynamics in Europe are testing.

**Table 1: Competitiveness by level and evolution of unit labour cost. ‘Traded’ activities (1995-00).**

Regional group	Diminution ULC	Growth ULC
30 most competitive regions (low ULC level)	at2 Südösterreich at3 Westösterreich de5 Bremen* dk Denmark* fi1 Manner-Suomi fr21 Champagne-Ardenne fr23 Haute-Normandie fr24 Centre fr25 Basse-Normandie fr3 Nord - Pas-de-Calais fr43 Franche-Comté fr51 Pays de la Loire fr53 Poitou-Charentes* fr63 Limousin* fr71 Rhône-Alpes fr72 Auvergne ie01 Border, Midlands and Western ie02 Southern and Eastern se0a Västsverige	fr22 Picardie fr41 Lorraine fr42 Alsace nl1 Noord-Nederland se02 Östra Mellansverige se04 Sydsverige se06 Norra Mellansverige se07 Mellersta Norrland se08 Övre Norrland se09 Småland med öarna ukn Northern Ireland
56 regions of intermediate competitiveness	at1 Ostösterreich be1 Région de Bruxelles-Capitale be2 Vlaams Gewest de1 Baden-Württemberg de4 Brandenburg de7 Hessen de8 Mecklenburg-Vorpommern de9 Niedersachsen ded Sachsen dee Sachsen-Anhalt deg Thüringen es11 Galicia es12 Principado de Asturias es21 Pais Vasco es22 Comunidad Foral de Navarra es62 Región de Murcia* fr1 Île de France fr52 Bretagne fr61 Aquitaine fr62 Midi-Pyrénées fr81 Languedoc-Roussillon fr82 Provence-Alpes-Côte d'Azur fr83 Corse	de2 Bayern de3 Berlin de6 Hamburg dea Nordrhein-Westfalen deb Rheinland-Pfalz dec Saarland def Schleswig-Holstein es13 Cantabria es23 La Rioja es24 Aragón es3 Comunidad de Madrid es41 Castilla y León es51 Cataluña es52 Comunidad Valenciana fi2 Åland fr26 Bourgogne itc4 Lombardia lu Luxembourg (Grand-Duché) nl3 West-Nederland pt1 Continente (PT) ukc North East* uke Yorkshire and The Humber ukf East Midlands*

	itc1 Piemonte* nl4 Zuid-Nederland se01 Stockholm	ukg West Midlands ukh Eastern uki London ukj South East ukk South West ukl Wales* ukm Scotland*
30 less competitive regions (high ULC level)	be3 Région Wallonne es61 Andalucia es7 Canarias gr3 Attiki itc2 Valle d'Aosta/Vallée d'Aoste itc3 Liguria itd5 Emilia-Romagna ite1 Toscana ite3 Marche itf1 Abruzzo itf2 Molise itf3 Campania itf5 Basilicata itg1 Sicilia pt2 Região Autónoma dos Açores pt3 Região Autónoma da Madeira	es42 Castilla-la Mancha es43 Extremadura es53 Illes Balears gr1 Voreia Ellada gr2 Kentriki Ellada gr4 Nisia Aigaiou, Kriti itd3 Veneto* itd4 Friuli-Venezia Giulia ite2 Umbria ite4 Lazio itf4 Puglia itf6 Calabria itg2 Sardegna nl2 Oost-Nederland*

Source: Own computation based on the Eurostat's REGIO data base.

According this classification, we cannot identify any clear pattern of association to each regional group. In fact, we can find regions with a very different economic level in a similar competitive situation. It is the case, for example, of Veneto or Friuli-Venezia Giulia that shares the row of the less competitive regions with poorer regions (Extremadura, Azores...). In the same way, the French region of Nord-Pas-of-Calais shares the row of most competitive regions with richer regions (Bremen, Southern and Eastern of Ireland...). Nevertheless, this regional taxonomy shows some national component. In fact, regions from countries of the centre and north of Europe (France, Austria, Ireland, Sweden and some German, Dutch and British region) predominate in the most competitive group. In the same way, there is a clear predominance of the regions from the Mediterranean countries (Spain, Portugal, Italy and Greece), along with some Belgian and Dutch region (that are exceptions that confirm the rule) in the less competitive group. Finally, the intermediate group (most numerous) include regions of very diverse origin.

On the other hand, we can emphasize the slight variability of the previous classification. In fact, there are only 6 interchanges of position in the analyzed period. Concretely, in the most competitive group in 2000 appear only 4 regions that were in the intermediate group in 1995 (Bremen, Denmark, Poitou-Charentes and Limousin), moving to this last group 4 British regions (North East, East Midlands, Wales, Scotland). Also, there are only 2 regions included in the less competitive group in 2000 (Veneto and Oost Nederland) that occupied the position left by another 2 regions (Murcia and Piemonte). The little variation concerning the composition of the different competitive groups verify that, in global terms, the differences of intra-sectoral cost in the production of tradable goods and services have been stationary with minimum variations. According to this fact, this classification seems to be quite consistent.

## ***6. The competitive level: an explanatory factor of the production and employment growth.***

A central idea in this paper is the supposed relation between the economic growth and the competitiveness that is understood here like an (absolute) advantage in costs. In fact this hypothesis has been analysed on an abundant empirical studies related to the national level<sup>5</sup>. Nevertheless, it is not possible to be affirmed the same concerning the European regional level because of statistical deficiencies, mainly with respect to data of trade<sup>6</sup>.

Considering the lack of complete and comparable data about trade of the European regions, we undertook the study of the regional competitiveness "jumping", but not ignoring, the trade link of the sequence from the competitive capacity to the growth of production and employment. It seems to be logical that a region that presents lower unit costs than most of the remaining regions, mainly in the less protected activities, will tend to include an increasing of market share. This would bring positive effects to the economic growth (production and employment) and the standard of life. Although the previous hypothesis can be quite logical, the final result cannot be clear if we consider the number of considered regions and productive activities.

In order to identify the existence of different competitive strategies from European regions, we additionally analyze the three groups regarding the classification that was established in the previous section<sup>7</sup>.

A first approach to the relation between competitive level and economic growth is the study related to the economic capacity from each regional group. In this sense, not important differences between the most competitive group and the intermediate group were observed, appearing even this last group with a higher level of GDP per capita (PPS data). Nevertheless, the less competitive group appears distanced of the other two groups. In reality, less competitive regions that show a higher level of unit costs in the 'traded' activities are also characterized by a lower economic capacity in relative terms, appearing clearly behind of the regions of high and intermediate competitive level.

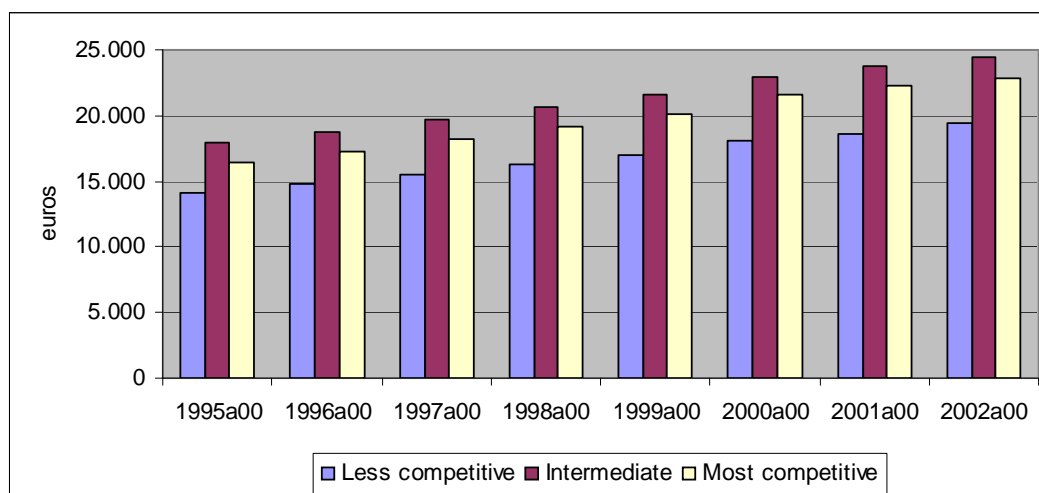
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<sup>5</sup> See D. Guerrero (1995) for details of some empirical studies.

<sup>6</sup> To be more exactly, we would have to also consider not only the external market share (exports) but also the internal (regional and national) market share, especially in a liberalized context as it characterizes to the European market.

<sup>7</sup> The group of the 30 most competitive regions, the group of the 56 regions of intermediate competitiveness and the group of the 30 less competitive regions.

**Figure 5: GDP per capita (PPS) and competitive level. Regional groups (1995-2002)**



Source: Own computation based on the Eurostat's REGIO data base.

On the other hand, the study of the relation between level of unit costs and level of GDP per capita through a simple linear regression show divergent results. Concerning the set of all the 116 regions a negative relation between both variables is observed, reflecting the negative effect of the unit labour cost level on the GDP per capita although the quality of the adjustment is not fine (R-Squared=8%). This negative relation stays clearly in the group of the less competitive regions, where the quality of the adjustment even increases (R-Squared=15%). Nevertheless, this negative effect is lost in the most competitive group and in the intermediate one, where the quality of the adjustment is practically zero.

These previous results verify the existence of a negative relation between the level of unit costs and the level of GDP per capita, although this relation is clearer in the group of less competitive regions, in which most of the poor regions of the south of Europe are included. The productive structure of these regions is commonly based on traditional sectors (food and textile products, tourism...) with a very low technological capacity (both about effort and results) and productivity. This picture is according to the high level of the unit cost in their respective 'traded' activities.

In contrast, the economic situation of the regions with an intermediate or high competitive level (reduced unit costs) seems to depend less on this variable, which can be due to the existence of other factors that affect to their success in the market (quality, differentiation of products, prestigious trademarks...).

An additional and crucial question of present work is the relation between the competitive level and the regional economic dynamics, referred this last one fundamentally to the evolution of the real income and the employment<sup>8</sup>. In this point we must emphasize the fact that direct or lineal relation between both dimensions is not observed. From an aggregated perspective (116 regions), positive coefficients are

<sup>8</sup> This is the notion of "aggregated competitiveness" of an Economy, present in many studies on competitiveness.

obtained but the results are very little consistent, especially if we take into account the poor quality of the regression (R-Squared practically null). Identical result is obtained concerning both the most numerous group (intermediate competitiveness) and the less competitive one. Nevertheless, a better quality of the adjustment is achieved in these cases. On the contrary, the 30 most competitive regions offer quite divergent results. This most competitive group shows a negative relation and better quality of the adjustment. This fact can be interpreted in the sense that the most competitive regions (lowest unit labour costs) also follow an economic evolution especially sensible to their level of competitiveness. This result let us to venture the hypothesis that these highly competitive regions show a more related evolution of their production and employment to the level of the unit labour cost because they compete with very reduced margins and they are very sensible to the fluctuations in their competitive level. We will return in the following section about this hypothesis.

On the other hand, the negative effect from the unit labour cost level over the employment growth regarding the less competitive regions should be underlined. Furthermore, the quality of this adjustment is higher than in the most competitive group (R-Squared = 14%) and even more if we consider the Employment growth in ‘traded’ activities (R-Squared=22%). Surely there are specific factors behind these differences like the different sectoral composition (labour intensive activities and a more sensible evolution of employment related to changes in the competitive level<sup>9</sup>).

**Table 2: The unit labour cost level (‘traded’ activities) and the economic growth.**

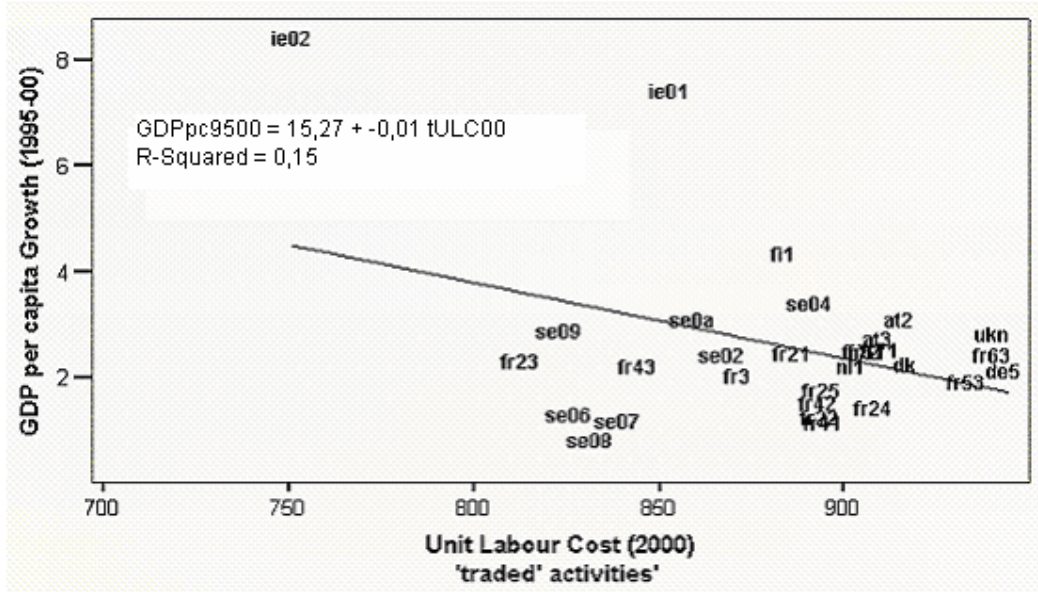
Ordinary Least Squares Estimation				
Independent variable is the Unit Labour Cost level in 2000 (‘traded’ activities)				
116 regions used for estimation				
Regional group (number of regions)	Dependent variables			
	GDP level 2000 (pps)	GDP Growth 1995-2000 (euro)	GDPpc Growth 1995-2000 (euro)	Employ Growth 1995-2000
<b>Most competitive (30)</b>				
Coef. $\beta$	-7.534	-0.014	-0.014	-0.007
Standard Error	12.218	0.008	0.006	0.006
T-Ratio	-0.617	-1.813	-2.222	-1.141
R-Squared	0.013	0.105	0.15	0.044
R-Bar-Squared	-0.022	0.073	0.12	0.010
<b>Intermediate (56)</b>				
Coef. $\beta$	2.669	0.004	0.004	0.006
Standard Error	21.251	0.004	0.003	0.003
T-Ratio	0.126	0.890	1.326	1.619
R-Squared	0.000	0.014	0.032	0.046
R-Bar-Squared	-0.018	-0.004	0.014	0.029
<b>Less competitive (30)</b>				
Coef. $\beta$	-9.083	0.001	0.001	-0.002
Standard Error	4.008	0.001	0.001	0.001
T-Ratio	-2.266	0.660	0.856	-2.172
R-Squared	0.155	0.015	0.026	0.144
R-Bar-Squared	0.125	-0.020	-0.009	0.114
<b>Total (116)</b>				
Coef. $\beta$	-8.055	9.712E-05	2.329E-06	-0.001
Standard Error	2.593	0.001	0.001	0.001
T-Ratio	-3.107	0.142	0.004	-0.919

<sup>9</sup> Phenomena of deflection of labour intensive activities could even hide here and this fact would especially affect to the employment data.

R-Squared	0.078	0.000	0.000	0.007
R-Bar-Squared	0.070	-0.009	-0.009	-0.001

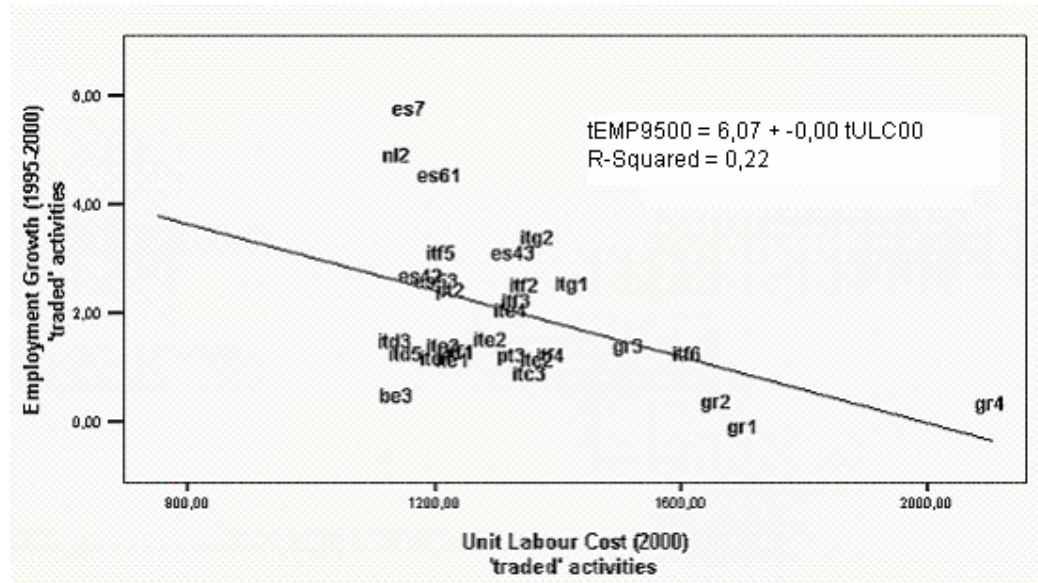
Source: Own computation based on the Eurostat's REGIO data base.

**Figure 6: Competitive level and economic growth in the most competitive group (1995-2002)**



Source: Own computation based on the Eurostat's REGIO data base.

**Figure 7: Competitive level and Employment growth in the less competitive group (1995-2002)**



Source: Own computation based on the Eurostat's REGIO data base.

These results show that there is a relation between the level of unit costs of the 'traded' activities and the economic dynamics of the European regions, but it is far from a

homogeneous and linear pattern. On the contrary, there are diverse regional behaviours that require a more specific analysis taking into account the specificities of the regions that are included in each group. In this sense, the used criterion of grouping according to the unit labour cost level allows for observing partly that diversity of behaviours. Especially, we detect a positive effect of the competitive level on the production and the employment growth in the case of the most competitive regions, although only on the employment in the case of the less competitive regions. On the other hand, any clear relation in the intermediate group is not observed, which can be due to the heterogeneous nature of the included regions and to other explanatory factors (specific competitive advantages).

In order to extend the previous analysis, we tried to analyse the evolution of the GDP per capita concerning the three regional groups during period 1995-2002<sup>10</sup>. Some interesting results must be underlined.

Firstly, when the level of the GDP per capita (expressed in Purchasing Power Standard units) is considered, the two most competitive groups are characterized by the best economic situation. In contrast, the less competitive (highest unit labour costs) shows a lower level of the GDP per capita (figure 5).

Secondly, remarkable differences between both extreme of the competitive stairs of the European regions are observed. Nevertheless, the intermediate group follows a similar evolution like the most competitive one (figure 8).

Thirdly, when the evolution of the GDP per capita (expressed in euros at constant prices of 1995) is analysed, then a higher dynamism of the most competitive regions is observed. In fact, the economic growth rates of these regions seem to be higher than in the other two groups, especially in the years of highest growth of the period (1998, 1999 and 2000) (figures 8 and 9).

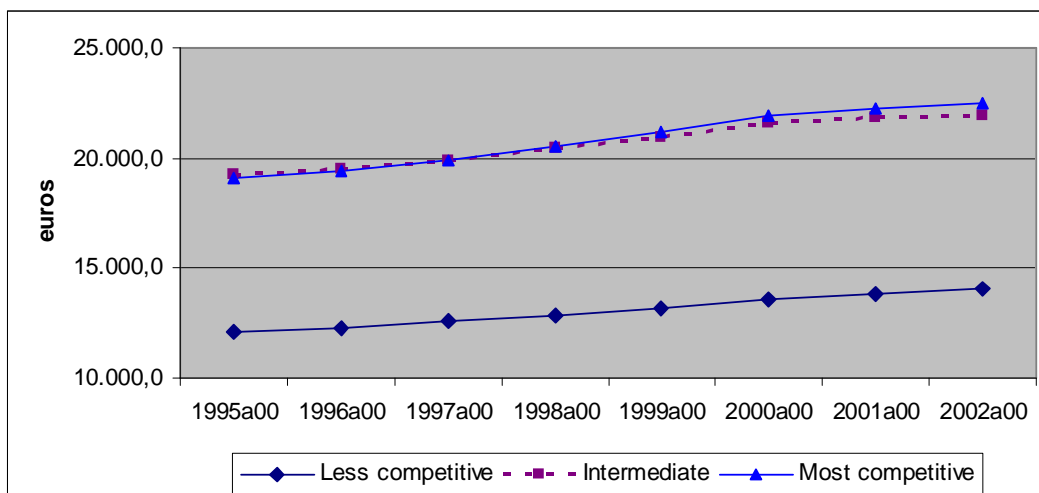
Finally, the less competitive group (regions with highest unit labour costs) is the only one that grows at low rate during the years of highest growth. Nevertheless, this group is also the only one that notes the less negative effect of the recessive phase of the economic cycle (figure 9).

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<sup>10</sup> The period extends two years more (until 2002) in this case due to the availability of data for this variable, at the same time that allows capturing a longer sequence of the economic cycle.

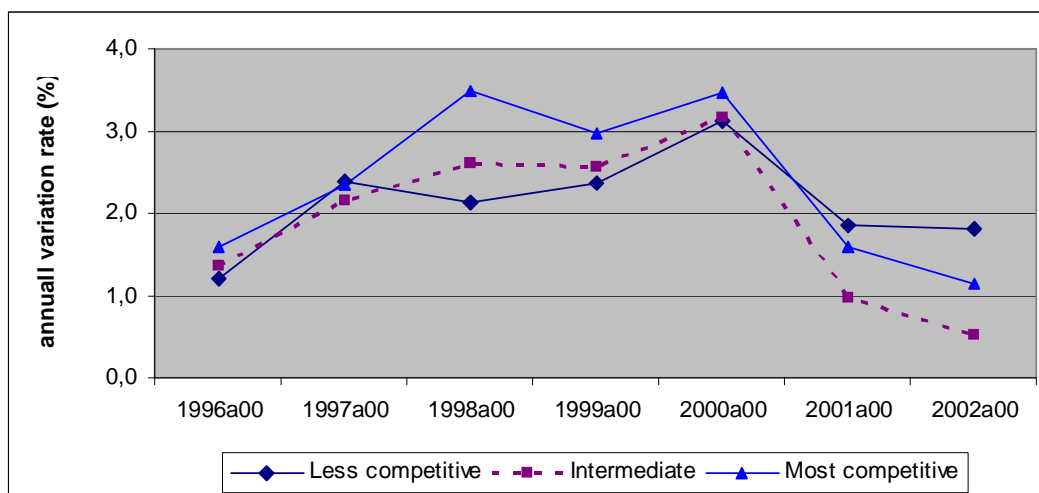


**Figure 8: GDP per capita by regional group (1995-2002). Euros at Constant prices 1995**



Source: Own computation based on the Eurostat's REGIO data base.

**Figure 9: GDP per capita Growth by regional group (1995-2002). Annual variation rates**



Source: Own computation based on the Eurostat's REGIO data base.

**7. *The competitive evolution and its impact on economic dynamics: the question of the “Kaldor paradox” from the European regional perspective.***

In the preceding epigraph the relevance of the unit labour cost level to explain the production and/or the employment growth of the European regions was verified. This relation was especially clear in the case of the regions that are included in both extreme of the "competitive scale". In other words, these results confirm the supremacy of the law of the absolute advantage, in the sense of a relative advantage related to the intra-sectoral costs, at the time of explaining the economic dynamics of the European regions.

The previous analysis would be incomplete if an element that predominates in the studies on competitiveness is not considered. This factor is the unit labour cost evolution, which depends on the changes of the productivity and the price of labour. Many studies on competitiveness are centred in the analysis of this element like potential explanatory factor of the regional dynamics. In fact, this kind of analysis is the centre of the famous "Kaldor paradox", that is the name that received the empirical result concerning the positive relation of causality of the increase of the production costs over the increase of the market share. In our opinion, this empirical paradox that is the central theme of an important part of economic literature has been partly based in a mistaken explanation of the competitiveness. Actually many of these works have been centred exclusively in the evolution of the unit costs, identifying this last one like the only determining factor in the explanation of the competitiveness. These works consequently forget that what really explains the success in the market is the supremacy in the unit costs level (absolute advantage) and not as much its evolution (next to the idea of the comparative advantage).

Sometimes the most competitive economies and, therefore, of higher economic growth are also those with higher increases in their costs, without losing for that reason their competitive superiority. This case would be apparently coherent with the conventional interpretation related to the "Kaldor paradox". Nevertheless, are there other factors not related to the costs that explain the competitiveness and the economic growth? In order to assure this its unit costs level should be higher than the rival economies, but data have demonstrated that it is not thus. These economies have grown more than others, as much their market share as their real income and employment, but in spite of the increasing costs they still keep an advantage of costs on their rival economies. This fact explains their competitive success to a great extent, although this does not have to be always like thus.

A positive correlation between the unit labour cost ('traded' activities) and its evolution in the time is observed in the case of the European regions. This result is coherent with the hypothesis that identifies the most (less) competitive regions with the regions that experiment the best evolution (reduction) in their costs. In fact, this result helps us to understand the lack of significant changes in the composition of the three competitive groups during the considered period<sup>11</sup>. Nevertheless, in view of the competitive groups, a clearer positive relation in the case of the less competitive regions is observed. This result is coherent with the well known difficulty of the less advanced regions to improve their competitive level. The opposite happens in the group of the 30 more competitive regions, where the positive character of the relation between level and evolution of the unit costs is puzzled. Behind this fact there are the lower margins of competitiveness<sup>12</sup> in which these regions move, together with their higher social capacity.

We obtained interesting results from the analysis of the effect of the unit labour cost evolution on the economic growth. Furthermore these results can be related to the previously pointed debate. First, a negative impact of the unit labour cost evolution on the production (both global and per capita) and the employment is found at level of the 116 regions. This global fact indicates that the regions that have more increased their unit labour costs are those characterised by a lower economic growth and, therefore, this result is in disagree with the "Kaldor paradox". Nevertheless, the quality of the

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<sup>11</sup> We must remember that only 6 shifts that gave rise to changes of group between years 1995 and 2000 were found.

<sup>12</sup> A level of 4 times lower dispersion in the unit costs of the most competitive regions over the less competitive regions is observed.

adjustment is so poor (R-Squared close to zero) that does not allow us to point out any definitive conclusion.

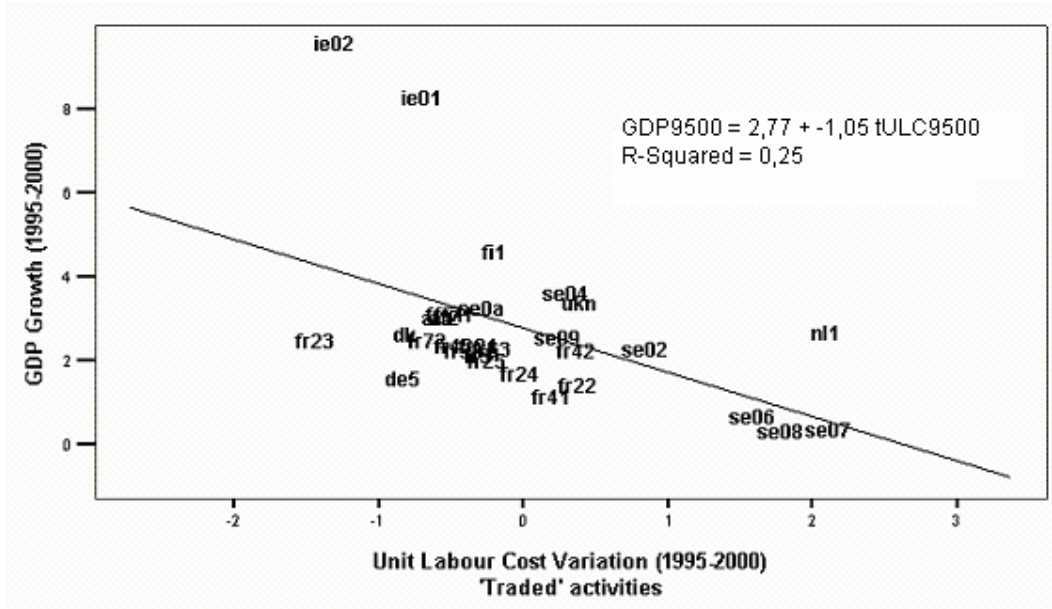
A separately analysis of the different competitive groups to identify diverse patterns of behaviour is necessary. In this sense, as a general rule, a clear and consistent relation between the evolution of the unit costs and the economic growth of the less and intermediate competitive groups is found. Nevertheless, the same empirical evidence is not found for the group of the 30 most competitive regions. In contrast, a strong and negative effect of the unit costs evolution on the production and employment growth is found, with a higher quality of the adjustment (R-Squared next and even over 20%). This last empirical result disagrees with the “Kaldor paradox”, although with a higher clearness than the results obtained before at global level. Factors that explain this fact are the lower gaps of unit labour costs in the most competitive regions that make their economic growth more sensible to any increase or diminution in the level of unit costs. In other words: changes in the competitive position (level) are more frequently in the most competitive regions and this reason explains because a clear and negative relation between the evolution of unit costs and production or employment is observed. Really, which this result shows is the superiority of the absolute advantage (an advantage of intra-sectoral costs) like an alternative explanation to others that are mainly based on the comparative advantage and the evolution of the productivity.

**Table 3: The unit labour cost variation (‘traded’ activities) and the economic growth.**

Ordinary Least Squares Estimation			
Independent variable is the Unit Labour Cost Variation 1995-2000 (‘traded’ activities)			
116 regions used for estimation			
Regional group (number of regions)	Dependent variables		
	GDP Growth 1995-2000 (euro)	GDPpc Growth 1995-2000 (euro)	Employment Growth 1995-2000
<b>Most competitive (30)</b>			
Coef. $\beta$	-1.054	-0.825	-0.677
Standard Error	0.349	0.303	0.275
T-Ratio	-3.021	-2.720	-2.459
R-Squared	0.246	0.209	0.178
R-Bar-Squared	0.219	0.181	0.148
<b>Intermediate (56)</b>			
Coef. $\beta$	0.045	-0.066	0.404
Standard Error	0.260	0.213	0.226
T-Ratio	0.174	-0.309	1.787
R-Squared	0.001	0.002	0.056
R-Bar-Squared	-0.018	-0.017	0.038
<b>Less competitive (30)</b>			
Coef. $\beta$	0.160	0.061	-0.077
Standard Error	0.214	0.199	0.196
T-Ratio	0.748	0.309	-0.393
R-Squared	0.020	0.003	0.005
R-Bar-Squared	-0.015	-0.032	-0.030
<b>Total (116)</b>			
Coef. $\beta$	-0.193	-0.211	-0.093
Standard Error	0.156	0.133	0.132
T-Ratio	-1.235	-1.590	-0.708
R-Squared	0.013	0.022	0.004
R-Bar-Squared	0.005	0.013	-0.004

Source: Own computation based on the Eurostat's REGIO data base.

**Figure 10: Unit Labour Cost Variation and GDP Growth. Most Competitive Group (1995-2000)**



Source: Own computation based on the Eurostat's REGIO data base.

Finally we can conclude that the previous results (as much at global level as by groups), confirm in any case the non existence of a clear and positive relation between the evolution of the unit labour costs and the aggregated competitiveness of economies, in the sense of the growth of real income and employment.

### 8. Final remarks.

The analysis of the situation and competitive evolution of the European regions from the perspective of the unit labour costs and their factorial decomposition have been the main objective of present work. In addition, we have analysed the relation between the level and evolution of the unit labour costs and the economic dynamics that these regions follow. Actually we tried to contrast the hypothesis that the level of unit labour costs (more than its evolution) to a great extent explains the economic growth of the European regions. Concerning the analysis of this hypothesis, we have found a positive correlation between level and growth of the unit labour costs that disagrees with the "Kaldor paradox" in the case of the European regions.

From an overall perspective (116 regions from EU-15) the analysis of data shows high disparities concerning the competitive capacity of the European regions measured by the level of unit labour cost. A similar result is achieved from a factorial decomposition perspective (unit labour requirement and unit price of labour). From a comparative point of view, we, however, found the highest disparities relating to the distribution of the unit labour requirement (the inverse of the labour productivity) that depends on dynamic and cumulative factors throughout the time with effects on the different regional technological capacities. We additionally observe that the disparities in the 'traded' activities are higher than in the 'non-traded' activities. This fact confirms that the market competition and the expectation of benefit far from restraining the

boundaries related to the unit labour costs and therefore also to the productivity and the wages push their disparate growth. In this way, regions with higher productive efficiency allow to guarantee higher wages to workers and in consequence a high standard of living to population. On the other hand, the less efficient regions in terms of labour productivity are pushed to moderate the wage growth and thus to preserve a certain level of competitiveness. This fact explains why this less protected sector of the economy is where these differences are more present.

The available data on the level and evolution of unit labour costs allow us to classify the European regions in three great groups from lower to higher competitiveness. This task allowed us firstly to verify the little variability concerning the composition of the three groups throughout the considered period (only 6 shifts). Secondly this taxonomy shows a certain national and economic component. Thirdly divergent behaviours related to the economic dynamics of each group are found. This fact shows the relevance of the sorting criterion (the level of unit labour cost).

In order to capture the competitive effect on the economic dynamics we chose all the 'traded' activities because are the less protected sector of the Economy. Our results confirm the importance of the competitive level (the level of unit labour cost) on the production and the employment growth concerning the most competitive group and the less competitive one. Nevertheless, only the effect on evolution of the employment is observed in this group what can be explained by the kind of activities that predominate in these less competitive regions. In fact, these activities are intensive in the employment of the labour force and therefore the competitiveness is bound to the wage moderation since they are characterized by reduced levels of productivity. On the other hand, the group of intermediate competitiveness does not show a clear behaviour in this sense. This fact can be explained by different factors: the heterogeneity of the regions that compose it, the close levels of competitiveness, or the existence of other competitive factors (quality, product differentiation...).

Another interesting result is the small or almost null impact of the evolution of unit labour cost on the economic growth. This empirical result confirms the lack of the "Kaldor paradox" in the case of the European regions, at least in its more extended form. It is more, far from this paradox, a negative relation between both variables is found, which rejects the hypothesis that the aggregated competitiveness of economies not depends essentially on the costs.

Our results seem to be coherent with the hypothesis that emphasizes the role played by the differences of the unit labour cost like a major factor of competitiveness in the case of the most competitive European regions. This relation is less clear at general level as well as in other regional groups because of the great heterogeneity of their regions as to other factors. One of these factors is, for instance, the higher differentials of unit labour costs in the less competitive group, along with the lack of the required social capability to improve the competitive level. We mustn't forget the influence of other factors not related to the costs that have an effect on the competitiveness of the regions. These last factors can be decisive in some sectors, but its effects are very difficult to measure (tourist attractive, well-known trademark, product quality and differentiation...).

Finally, we can conclude that the achieved results confirm the superiority of the absolute advantage at the time of explaining the economic dynamics of the European regions. In other words: a lower level of costs determines a higher economic growth and an improved competitiveness both in the external and internal market. Nevertheless, we

must not ignore the existence of other explanatory factors that can be decisive in some activities.

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