

Guisan, M.Carmen; Cancelo, M.Teresa

**Conference Paper**

## Wages, Employment and Productivity in EU and USA

44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism",  
25th - 29th August 2004, Porto, Portugal

**Provided in Cooperation with:**

European Regional Science Association (ERSA)

*Suggested Citation:* Guisan, M.Carmen; Cancelo, M.Teresa (2004) : Wages, Employment and Productivity in EU and USA, 44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/117194>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

Wages, Employment and Productivity in European Union and comparison with the USA.

By GUISAN, M.Carmen [eccgs@usc.es](mailto:eccgs@usc.es)  
and CANCELO, M.Teresa

Faculty of Economics. University of Santiago de Compostela, Spain

Abstract:

We analyse the evolution of regional employment in EU countries, and present some econometric models which relate employment with wages, economic growth and productivity. This study points to the main causes the important regional disparities of wages and rates of employment that exist in EU15 and EU25, as well as the low level of the average rate of employment in comparison with the USA and other areas. Finally we suggest some European policies that should be had into account in order to foster employment and real wages in the less developed regions as well as the average rate of employment of European Union.

## **1.- Introduction**

European policies for regional development need to be improved in order to reach so good levels as the USA regarding average real wages and high rates of non-agrarian employment. European Union has developed policies as those outlined in the White Paper of the European Commission(1994) which are not enough to reach the same levels of the USA. One of the main differences between EU and the USA is the different procedures to advise political economies, while in the USA many outstanding economists participate in Advisory Boards and the newspapers and television channels have a role in the discussion among experts on the main economic policies, in the European Union the opinion of experts is not so frequently asked for by the Commission and the role of newspapers and televisions in this regard is usually only focused on national policies but not in European policies.

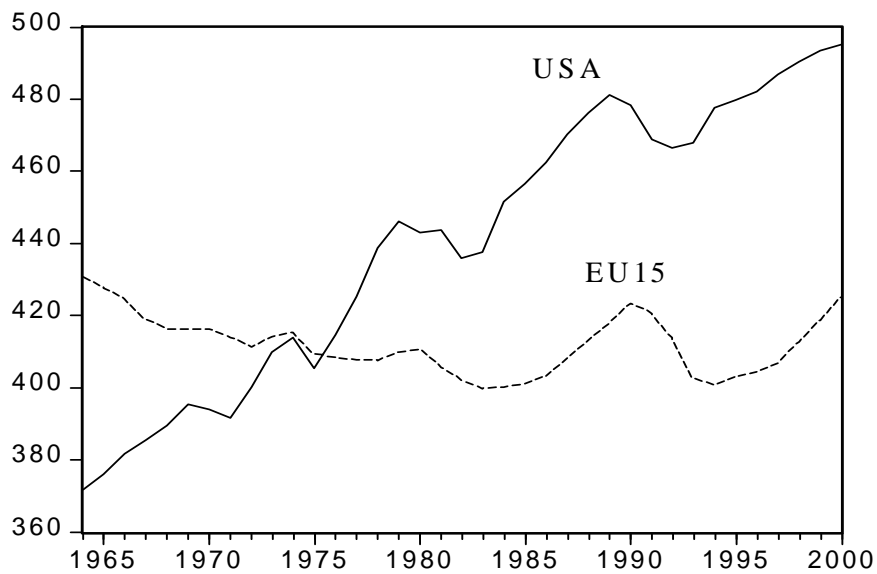
In section 2 we present a comparative analysis of employment and wages in EU and the USA. In section 3 we present a general view of the regional differences in the rates of employment by sector and in GDP per inhabitant in European Union after the Enlargement of year 2004 to 25 countries. In section 4 we present some econometric models related with employment and wages, and finally in section 5 we present the main conclusions.

## **2.- A comparative analysis of employment and wages in EU countries and the USA.**

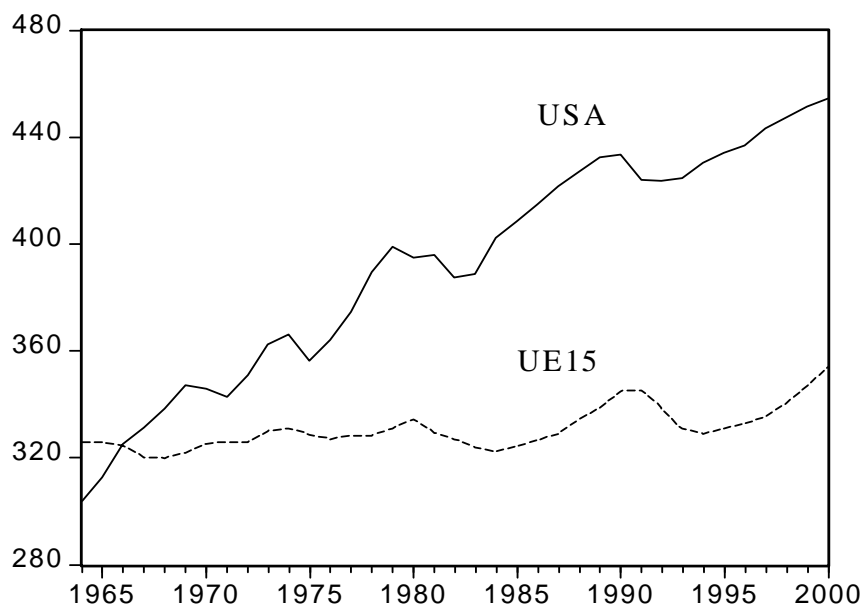
The European Union has shown in the last decades of the 20<sup>th</sup> century a worse performance than the USA in relation with employment creation and the level of average wages. Graphs 1 to 4 show the differences between EU15 and the USA in relation with employment and wages, for the period 1964-2000.

In graphs 1 and 2 we see that the rate of total employment, as well as the rate of wage earners, per one thousand inhabitants in European Union is very similar in 1964 and 2000, and clearly below the USA values, while the rates of employment in the USA have experienced an important increase during the period 1964-2000.

Graph 1  
Total Employment per one thousand inhabitants in Europe and the USA



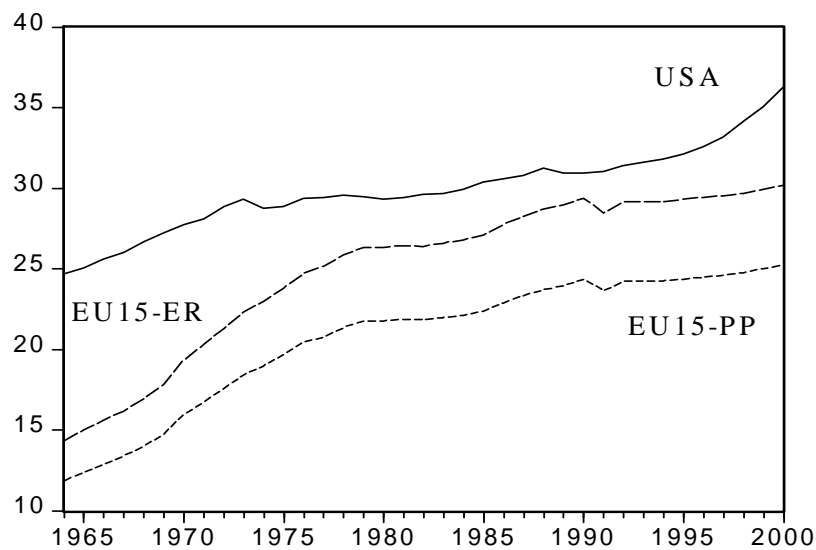
Graph 2  
Number of Employees per one thousand inhabitants in Europe and the USA



Regarding the average real wages we find that the evolution has been also more favourable in the USA than in the European Union of 15 countries, EU15, both at Exchange Rates (W) or at Purchasing Power Parities (WPP). The ratio between WPP of EU15 and the real wage of the USA has increased substantially during the period 1964-1980, from less than 50% to nearly 75%, but it has not had a good evolution during the period 1980-2000. Although there are some effects of the unification of Germany in the decrease of year 1991, this is only a small part of the general decrease of the period 1990-2000, which seems to be due to special

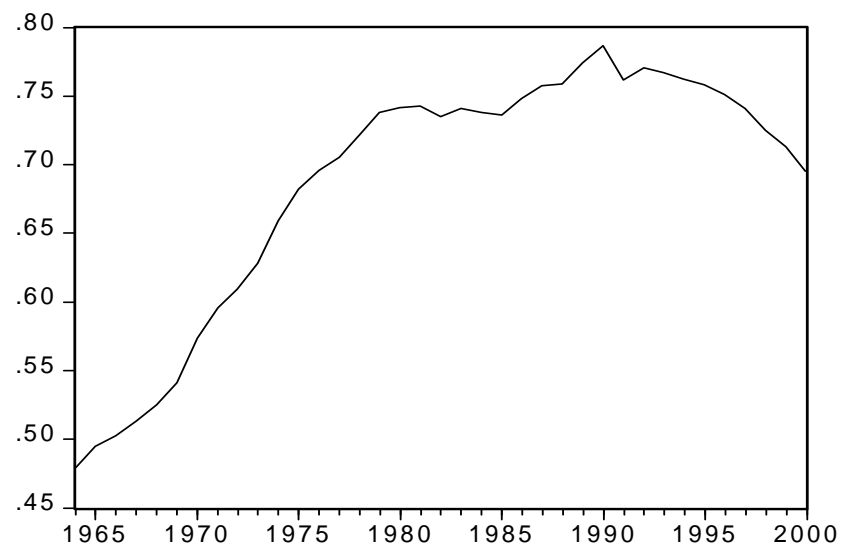
problems of European countries in relation with economic development and employment policies.

Graph 3. Real wages in dollars at 1990 prices



Graph 4

Ratio between average real wage at PPPs of EU15 and the USA



The sources of data were OCDE Labour Force Statistics for Total Employment (LT) and Wage Earners (LW), and OCDE National Accounts for Compensation of Employees (CE). Data of average monetary wages, as to say at current prices, were calculated by means of the ratio between CE and LW ( $WM = CE/LW$ ), while average real wages were calculated by means of the ratio between WM and the Price of Consumption Index for each country and expressed in dollars at 1990 prices and Exchange Rates (ER), ( $W = (WM/PCI)/ER90$ ), or at 1990 prices and Purchasing Power Parities (PP), ( $WPP = (WM/PCI)/PP90$ ).

We must realize that these real wages are gross, before fiscal taxes on labour income, and thus the differences would be even more favourable for the USA if we would make the

comparison with real net wages, after fiscal taxes deduction, as those taxes are lower in the USA.

The differences in income per inhabitant and wages among European regions are, on the other hand, higher than in the case of the USA, even before the 2004 Enlargement from 15 to 25 countries, and thus it is very important for people leaving in the less developed regions of EU to insist upon the convenience of improving European labour policies, both regarding employment and wages, with a main emphasis of the diminution of regional disparities improving policies specially in the less favoured regions.

Many economic researchers in several publications and communications at Congresses, as many of the interesting meetings organized by ERSA during the last two decades, have tried to make useful recommendations to European Union in this regard, but unfortunately very few of their suggestions have got to be know by politicians and public opinion, because there are not enough channels to create public opinion sectors in Europe as a whole.

Televisions, newspapers, publishers of books and journals, even of academic journals, have usually only a national focus on only a small part of Europe and very few have a broader European view. The obsolete and distant Euro-bureaucracy has not helped much in this regard to facilitate bilingual or multilingual translations of research recommendations to improve debates and interchange of ideas of European economic researchers among themselves and with politicians. In some countries like Spain and Portugal there is besides that an important problem due to the rigid electoral system which gives more power to the internal high level bureaucracies of parties than to the general wish of the citizens which are only allowed to choose a political party but not the persons who will become their representatives, because they only can vote to a closed and blocked lists, in many cases with 10 or more names, selected by the leaders of the parties.

European Union need to get next to citizens and the reforms to be performed in the next years are really important. To follow similar policies to the USA in the improvement of economic and social research will be indeed important to improve employment and development at regional level.

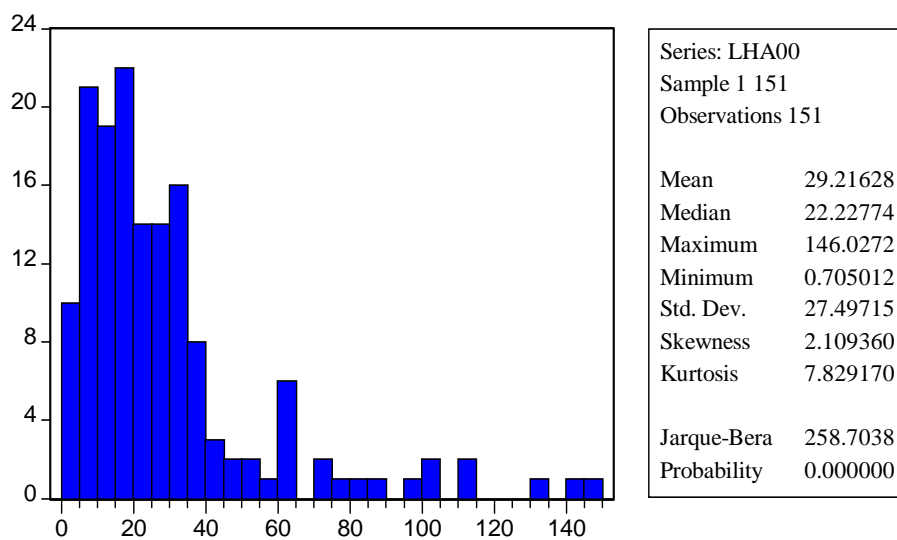
On section 3 we analyse regional differences of employment rates and real income per inhabitant in EU25. In section 4 we present some econometric models which explain the different evolution of EU15 and the USA, and finally in section 5 we present the main conclusions.

### **3.- Regional differences of employment and income per inhabitant in EU25 regions.**

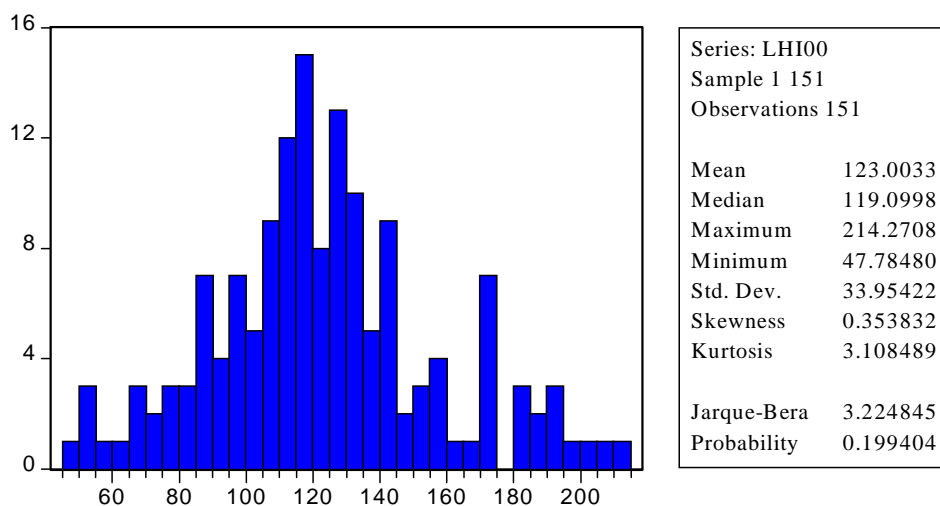
Graphs 5 to 7 show the distribution of the rates of employment by sector in 151 European regions of 25 countries in year 2000. There we can see that there are many regions with very low values of employment.

Graphs 8 and graph 9 show the positive correlation existing between the rate of non-agrarian employment (LHNA) and Gross Domestic Product per inhabitant (QH) in 151 regions of EU25 in year 2000.

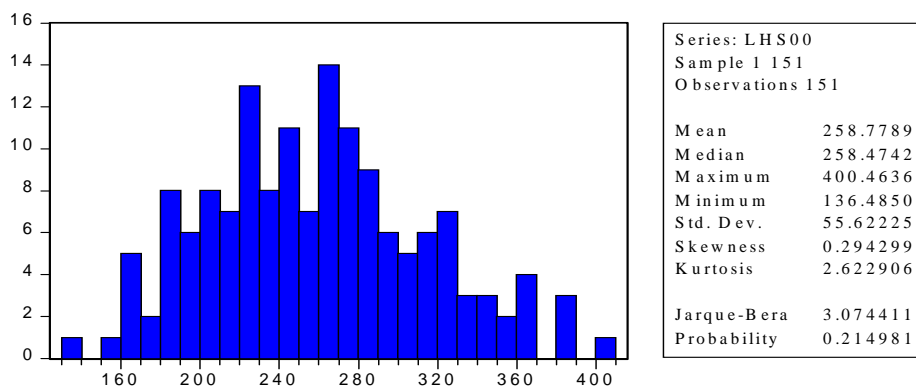
Graph 5. Regional distribution of the rate of employment of Agriculture



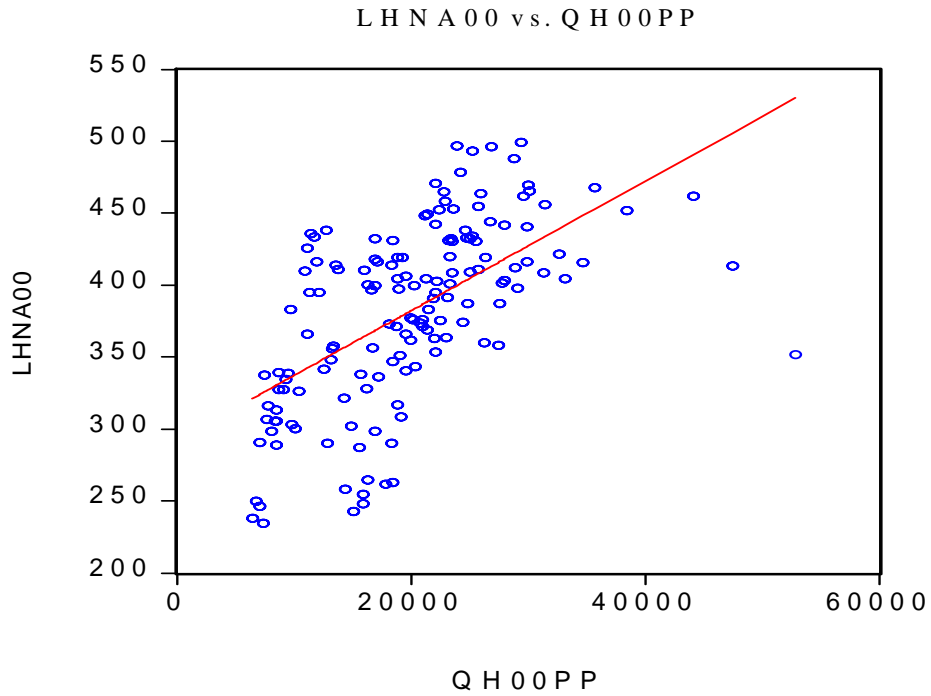
Graph 6. Regional distribution of the rate of employment of Industry and Building



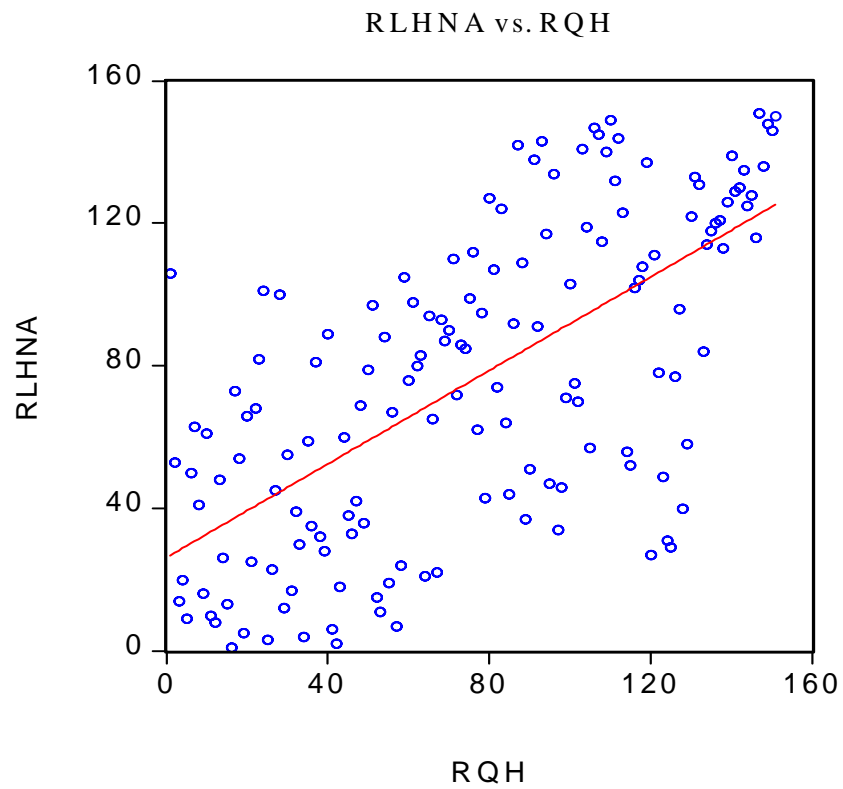
Graph 7. Regional distribution of the rate of employment of Services



Graph 8. Rate of non-agrarian employment (LHNA) and Gdp per inhabitant (QH)



Graph 9. Ranking of the rate of non agrarian employment and ranking of QH



#### 4.- Econometric models for non-agrarian employment and wages in EU countries.

Model 1 presents a cross-country model for 11 European Union countries for non agrarian employment, LNA, in the period 1991-2000, where LNA is expressed as a function of its lagged value and the increase in real GDP and real wages, at 1999 prices.

Model 1 Log-linear model for LNA  
 Dependent Variable: LOG(LNA?)  
 Method: Pooled Least Squares  
 Sample(adjusted): 1991 2000  
 Included observations: 10 after adjusting endpoints  
 Number of cross-sections used: 11  
 Total panel (balanced) observations: 110  
 White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(LNA?(-1))	0.999345	0.000296	3374.615	0.0000
D(LOG(GDP99?))	0.704718	0.073715	9.560092	0.0000
D(LOG(W99?))	-0.043407	0.079492	-0.546057	0.5862
R-squared	0.999757	Mean dependent var	8.718878	
Adjusted R-squared	0.999752	S.D. dependent var	1.031234	
S.E. of regression	0.016241	Sum squared resid	0.028222	
F-statistic	219687.8	Durbin-Watson stat	1.453594	
Prob(F-statistic)	0.000000			

Model 2 presents the relation between wages and productivity in 23 OECD countries, including EU15 countries, during the period 1965-2000. We have included also an indicator of the level of employment, with a positive effect on wages according to the expected sign, and trend represented by time (TI) in order to have into account other effects.

Model 2. Relation between wages and productivity in OECD countries  
 Dependent Variable: W90?PP  
 Method: Pooled Least Squares  
 Sample(adjusted): 1965 2000  
 Included observations: 36 after adjusting endpoints  
 Number of cross-sections used: 23  
 Total panel (unbalanced) observations: 731  
 White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
W90?PP(-1)	0.997790	0.004315	231.2493	0.0000
D(PM?PP)	0.335643	0.040621	8.262883	0.0000
(LT?(-1)/POB?(-1))	1.285168	0.178127	7.214887	0.0000
TI	-0.017075	0.002679	-6.374496	0.0000
R-squared	0.989444	Mean dependent var	20.28128	
Adjusted R-squared	0.989401	S.D. dependent var	5.506496	
S.E. of regression	0.566907	Sum squared resid	233.6454	
Log likelihood	-620.3516	F-statistic	22715.42	
Durbin-Watson stat	1.563532	Prob(F-statistic)	0.000000	



## **5.- Conclusions.**

European Union has many challenges after the Enlargement of the year 2004 in order to improve real income per inhabitant, real wages and the rates of employment. The data and models here present show a high superiority of the USA in comparison with European Union and suggest the convenience of change in excess bureaucracy of EU and to improve communication of EU institutions with citizens and economic researchers. Changes in European wide focus of newspapers and social means of communication are also needed.

## **Bibliography**

AGUAYO, E. and GUI SAN, M.C.(2004) Econometric Models of Employment and Population in European and North-American Regions. *Applied Econometrics and International Development* Vol. 4-2, April-June 2004.<sup>1</sup>

BIRG, H.(1981). "An Interregional Population-Employment Model for the Federal Republic of Germany: Methodology and Forecasting Results for the year 2000". *Papers of the Regional Science Association*, vol 47. pp.97-117.

BOLTON, R.(1993). "Regional Econometric Models". En BODKIN, R.G, KLEIN, L.R. y MARWAH, K. (edit.) "A history of Macroeconometric Model-Boulding". pp. 451-479. Edward Elgar Publishing. New York.

CATIN, M. (1992). "La modélisation régionale". En: DERYCKE, P. (ed.) "Espace et dynamiques territoriales". Economica. París. pp. 187-213.

CLARK, D.E. y MURPHY, C.A.(1996). "Countywide Employment and Population Growth: an Analysis of the 1980s". *Journal of Regional Science*, vol.36-2, pp.235-256.

COURBIS, R. (1979). "Modèles régionaux et modèles régionaux-nationaux". Actes du II Colloque international d'Econometrie appliquée. Editions Cujas.

CHANG, S. (1974). "An Econometric Forecasting Model Based on Regional Economic Information System Data: The Case of Mobile Alabama". *Journal of Regional Science*. Vol. 19, pp. 293-319.

EUROSTAT. *Base de datos REGIO*.

FAGERBERG, J.; VERSPAGEN, B. y CANIËLS, M.(1997). "Technology, Growth and Unemployment across European Regions". *Regional Studies*, Vol. 31,5-pp.457- 466.

FREEMAN, D(2001). "Source of Fluctuations in Regional Growth" *Annals of Regional Science* 35, pp. 249-266.

GLICKMAN, N.J.(1977). "Econometric Analysis of Regional Systems: Explorations in Model Building and Policy Analysis". *Studies in Urban Economics*. Academic Press, New York.

GREENWOOD, M.J.(1985). "Human Migration: Theory, Models and Empirical Studies". *Journal of Regional Science*, vol.25-4. pp.521-544.

GUISÁN, M.C. (1985 a). "Crecimiento económico y distribución espacial de la población". *Papeles de Economía Española*, nº3, pp. 75-82.

GUISÁN, M.C. (1985 b). “Crisis económica y crecimiento urbano en España(1970-81)”. *IX Reunión de Estudios Regionales*. pp. 443-452. Santiago de Compostela.

GUISÁN, M.C.(2000). “Educación, empleo e poboación de Galicia”. *Revista Galega de Economía*, vol.9, nº 1, pp. 153-166.

GUISAN, M.C.(2004). *Employment and Industry in European Union: Econometric Models and International Comparisons with the USA, Japan, India and China*. Working Paper of the Series *Economic Development*, no. 78, free on-line.<sup>1</sup>

GUISÁN, M.C. y CANCELO, M.T. (1996). "Territorial Public Expenditure and Revenue: Economic Impact in the European Regional Growth". *European Regional Science Association. 36th European Congress, Zürich*.

GUISÁN, M.C. y AGUAYO, E. (2001). “Panorama regional y sectorial del empleo en países de la Unión Europea 1985-2000”. *Estudios Económicos Regionales y Sectoriales*. Vol.1-núm.1. AEEADE. pp. 9-43.

GUISÁN, M.C. y AGUAYO, E., and CARBALLAS, D. (2004). “Human Capital, Industry, Tourism and Regional Development in EU25 Regions. ERSA 2004 Congress, Porto, Portugal.

GUISÁN, M.C.; CANCELO, M.T.; AGUAYO, E. y DÍAZ, R.(2001). *Modelos econométricos interregionales de crecimiento de la industria y los servicios en las regiones europeas. 1985-95*". Distribuye Mundi-Prensa, Madrid.

GUISÁN, M.C. and FRIAS, I. (1996). "Economic Growth and Social Welfare in the European Regions". *36th European Congress of European Regional Science Association, Zürich*.

KLEIN, L.R. (1969). "The Specification of Regional Econometric Models". *Papers of the Regional Science Association*, 23. pp. 105-115.

NAYMAN, L. and ÜNAL-KESENCI, D.(2001). “The French-German Productivity Comparison Revisited: Ten Years after the German Unification”. Working Paper no. 2001-14, CEPII, Paris.

SCHIMITT, B.(1999). “Economic Geography and Contemporary Rural Dynamics: An Empirical Test on Some French Regions”. *Regional Studies*, vol.33-8. pp.697-711.

VICENS, J. (1996). “Introducción a la modelización con datos de panel”. *Documentos del Instituto L.R.Klein*. Doc. 96/3. Universidad Autónoma de Madrid.

<sup>1</sup> articles and documents on line, available at: <http://www.usc.es/economet/welcomei.htm>