

**EMPLOYMENT AND PRODUCTIVITY IN THE EUROPEAN UNION AND
COMPARISON WITH THE USA, 1985-2005: ANALYSIS OF FRANCE,
GERMANY, ITALY, SPAIN AND THE UNITED KINGDOM**

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Abstract

The main emphasis of labour policies in several EU countries seem to have been addressed during the period 1985-2005 to contain the increases of real wages, under the misleading belief that lower wages could lead the policies to get higher employment rates. We show that the main policies to increase employment rates are not opposite to the increase of wages, and even the best labour policies, addressed to increase simultaneously labour productivity and employment, usually get both goals, as to say an increase in real wages and in the employment rate. We also analyse the main econometric approaches to the explanation of the evolution of these variables and present a comparison of their evolution in France, Germany, Italy, Spain and the United Kingdom.

JEL classification: C51, E61, J23, O51, O52

Keywords: Employment Policies in Europe, Productivity in EU and USA, Industry and Non-industrial Sectors, Econometric Models of Employment

1. Introduction

European Union has experienced a lower increase than the United States in real Gdp per inhabitant and difficulties to increase employment during the period 1985-2005. Our concern is related with the misleading European policies which are particularly damaging for the regions with lower levels of income per inhabitant. Here we present a comparative analysis of five major EU economies for the period 1985-2005. There are several important differences with the USA which explain the lower performance of EU labour markets: industrial development, human capital policies and taxes. Higher development of industry and human capital, and lower taxes, are of uppermost importance to explain the better performance of the USA in comparison with the general evolution of the EU.

Section 2 presents a short overview of selected literature on this subject. Section 3 analyses the evolution of employment, productivity per worker, and real Gross Domestic Product per inhabitant in France, Germany, Italy, Spain and the United Kingdom, showing the relationship between industry and non industrial development. Section 4 presents the estimation of some econometric models of employment, production and productivity. Finally Section 5 presents the main conclusions.

2. Economic literature on employment, productivity and wages.

An interesting study by Hein and Schulten(2004) questions the predominant view in the European Union policies addressed to diminish the increase of real wages in order to increase employment, and they consider that the foundations of that view are not convincing, neither theoretically nor empirically: "*Analysing the development in the EU*

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during the last four decades, no strictly inverse relationship between real wage growth and unemployment can be found.” “It is therefore concluded that the current EU economic and employment policies aiming at further wage restraint, wage differentiation and decentralization of collective bargaining are deeply misguided and have to be replaced by an alternative wage policy in Europe as part of a growth and employment oriented coordination of macroeconomic policies”.

Regarding the negative effects of wages and bureaucratic rigidities, Krueger and Psichke(1997) present an interesting analysis of the advantages of US's policies regarding the labour market in an international perspective, and conclude that product market constraints and other rigidities of European countries explain their lower performance in comparison with the US, while the lower wages in EU do not show an important role to increase the rates of employment. Card, Kramarz and Lemieux() found little evidence of wage inflexibilities to generate divergent patterns of employment growth in a comparison of the US, Canada and France. Nickell, Nunziata, Ochel and Quintini(2001) also analyzes unemployment and wage in OECD countries from 1960s to the 1990s, and Peeters and Reijer(2002) did not find a stronger real wage flexibility of the US in comparison with four European countries, in their study of wage and unemployment in Germany, Spain, France, the Netherlands and the US. The effects of taxation are analysed for several authors, as Riphahn and Bauer(1998) who test the possible negative impact of high payroll taxes in Germany, in particular social insurance contributions, and if they could explain the growing unemployment problem. Using industry level data for 1977-1994 they conclude that the employment effects of payroll taxes have only a moderate effect and that they are not the main causes of unemployment. Daveri and Tabellini(1997) analyse the effects of higher taxes on labor for 14 industrial countries between 1965 and 1991 and find striking support for the negative effects of high taxes, which reduce the growth rate of Gross Domestic Product and as a consequence affect negatively to the evolution of employment. Regarding the relation between employment and human capital, there are some interesting studies, as those by Tondl(1999) and Guisan and Aguayo(2005), trying to explain the uneven growth of Europe's poorer regions, having into account the low levels of human capital expenditure (both education and research), and recommending higher support to human capital from EU and national institutions to those regions. Some contributions to modelling employment and wages, such as in Guisan(2006) and Guisan and Aguayo(2007), have into account both demand and supply sides, including the important role of human capital, industry, trade, institutions and other relevant factors.

2. Evolution of real Gdp per inhabitant, Employment Rates and Productivity

Tables 1 to 4 show the evolution of the following variables: 1) Productivity per worker. 2) Industrial real value-added per inhabitant, 3) Non industrial real value-added per inhabitant, 4) Employment, and rates of employment. Data for productivity and real value-added in thousand dollars at 2000 prices, employment in thousand people and rates of employment in number of employments per one thousand people, elaborated from OECD National Accounts and Labour Force Statistics. Graphs 1 and 2 show the evolution of Industrial and Non-Industrial real Gdp per inhabitant (in thousand dollars at

2000 prices and exchange rates) in the five EU countries analyzed in this study for 1985-2005, in comparison with the USA.

Table 1. Productivity per worker in 5 EU countries

Country	1985	1990	1995	2000	2005
Germany	38.56	42.55	47.29	51.29	52.97
France	43.91	48.33	51.15	54.36	56.07
Italy	37.71	42.34	48.30	50.64	49.28
Spain	30.70	32.73	36.69	36.40	34.11
UK	39.95	42.61	47.25	51.75	56.94
EU5	39.06	42.65	47.13	50.10	51.05
USA	57.30	59.80	63.15	70.72	77.92

Note: thousand \$ at 2000 prices and exchange rates. Elaborated from OECD

Table 2. Industrial value-added per inhabitant

Country	1993	1995	2000	2003
Germany	4.85	4.97	5.19	5.11
France	3.30	3.58	4.11	4.19
Italy	3.44	3.80	3.99	3.93
Spain	2.17	2.28	2.69	2.66
UK	4.42	4.72	4.99	4.71
EU5	3.83	4.06	4.37	4.28
USA	5.05	5.60	6.29	6.09

Note: thousand \$ at 2000 prices exchange rates. Elaborated from OECD

Table 3: Non-industrial value-added per inhabitant

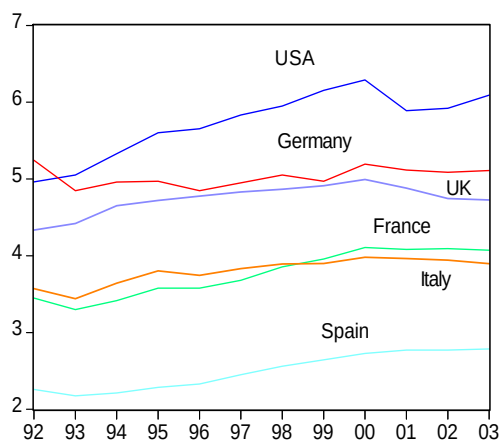
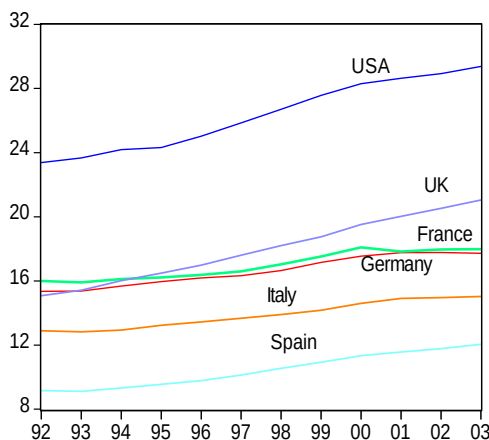
Country	1993	1995	2000	2003
Germany	15.39	15.98	17.57	17.74
France	15.93	16.24	18.11	18.00
Italy	12.85	13.25	14.62	15.04
Spain	9.13	9.57	11.36	12.06
UK	15.43	16.51	19.53	21.06
EU5	14.17	14.74	16.63	17.17
USA	23.69	24.33	28.32	29.40

Note: thousand \$ at 2000 prices and exchange rates. Elaborated from OECD

Table 4. Employment (million) and rates of employment (per thousand people)

Country	Employment					Rate of employment				
	1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
Germany	35.5	37.1	36.2	36.5	36.4	457	468	443	444	441
France	21.5	22.6	22.4	24.1	25.0	388	399	387	409	412
Italy	21.1	21.8	20.2	21.2	22.6	373	384	353	368	393
Spain	11.3	13.2	12.7	15.4	18.9	284	331	317	377	430
UK	24.4	26.9	26.0	27.8	29.5	431	471	449	474	468
EU5	113.8	121.6	117.5	125.0	132.4	400	421	400	420	434
USA	108.8	119.5	126.2	138.1	142.9	456	478	474	489	482

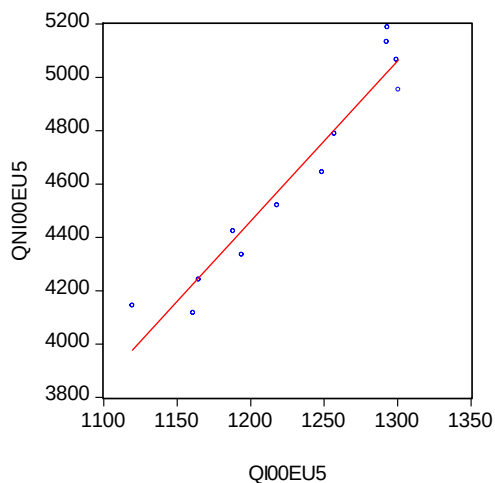
Note: Elaborated from OECD Labour Force Statistics and National Accounts Statistics

Graph 1. Industrial Gdp per inhabitant
(thousand \$ 2000 at exchange rates)Graph2. Non-Industrial Gdp per inhabitant
(thousand \$ 2000 at exchange rates)

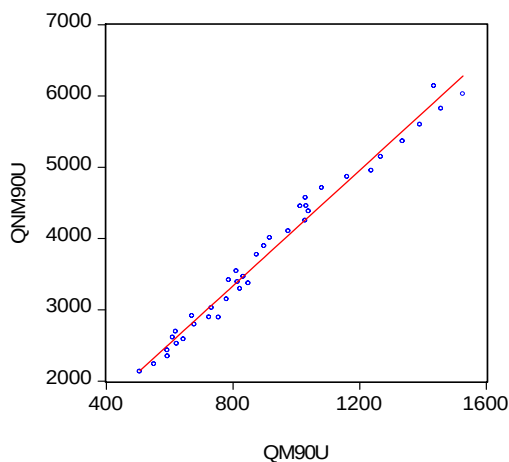
We can notice that since 1993 Industrial Gdp per inhabitant has reached highest values in the USA in comparison with Germany, which is the country with the highest value of this variable in this group of five EU countries, followed by the UK France and Italy. Spain has shown a very low degree of industrial production per inhabitant until 1995, with increase in the period 1995-2000 and almost stagnation afterwards.

Graphs 3 and 4 show the relationship between industry and non-industrial sectors in the five European Union of this study and the USA. In the case of EU data for the period 1993-2002 is in dollars at 2000 prices for the variables QI00 (Industry) and QNI00 (Non Industrial) while for the USA data for the period 1964-2001 is in dollars at 1990 prices for the variables QM90 (Manufacturing) and QNM90 (Non Manufacturing). Graphs 5 and 6 in the Annex show the evolution of the rates of employment and productivity.

Graph 3. QI and QNI in EU5



Graph 4. QM and QNM in USA



4. Econometric models: Non Industrial Gdp and Employment

We estimate equations (1) and (2) with a pool of EU5 countries and with data for the USA, following the approaches selected in Guisan(2006):

$$QNI_{it} = \beta_1 QNI_{i,t-1} + \beta_2 D(QI_{i,t}) + f(\text{other variables}) + \varepsilon_{1it} \quad (1)$$

$$Q_{it} = QI_{it} + QNI_{it}; \quad D(QI) = QI_t - QI_{t-1} \quad (2)$$

$$L_{it} = \beta_1 I_{i,t-1} + \beta_2 d(Q_{it}/W^*_{it}) + \beta_3 dPA_{i,t}) + f(\text{other variables}) + \varepsilon_{1it} \quad (3)$$

Where Q_{it} is real Value added of country i in year t , QI corresponds to industry and QNI to non industrial sectors. L is total employment, PA means Active Population and w^* is the expected value of average wage. For simplification it is assumed that it is proportional to the lagged value of w : $w^*_{it} = \delta w_{i,t-1}$. In the estimation we only include the two first terms of the right side of equation (1) and the three first terms of equation (3), although other variables will be included it in a forthcoming article. The effect of the missing variables affect to the estimated coefficients of the included variables, provided that the former are correlated with the latter, and to the autocorrelation of the random shock, as seen in Guisan(2006). Table 2 presents the estimation of (1) and (3). The pools of 5 EU countries corresponds to the periods 1992-2003 and 1985-2004, and the samples of the USA to the period 1970-2001 and 1970-2003. More results are included in the Annex.

Table 2. Estimated coefficients equations (1) and (3)

Equation 1	Pool EU5	USA	Equation 3	Pool EU5	USA
$QNI(-1)$	1.0148 (239)	1.0225 (472)	$L(-1)$	0.9992 (502)	0.9908 (305)
$D(QI)$	0.3309 (1.92)	0.9832 (5.59)	$D(Q/w(-1))$	0.1289 (3.79)	0.2019 (4.58)
			$D(PA)$	0.5079 (5.76)	1.0765 (5.90)

Note: Terms between brackets are t-ratios to show that coefficients are significantly non null (at 5% level in all the cases but in coefficient of $D(QI)$ of EU5 which is significant at 6% level. Goodness of fit is very high (see Annex)

The higher value of industrial and non industrial production per inhabitant is the main advantage of the USA in comparison with EU countries and it is in great part due to the positive effects of human capital on economic development as it has been analysed in Guisan and Aguayo(2005) and other studies.

5. European labour policies: suggestions and conclusions.

The lower rates of employment and wages in EU in comparison with the USA are due to a lower levels of industrial and non-industrial real value-added per inhabitant. Wages are not to be blamed as the cause of unemployment in EU countries, but the lack of policies to foster industrial development, research, education and other variables which explain the higher levels of the USA in comparison in Europe. It is clear that economic policies in the USA are more focused to the increase of real Gdp per inhabitant and employment. The successful development of those policies in Europe should imply more

dialogue between policy makers and the European society, including economics researchers. Unfortunately the Euro-sclerosis in the bureaucracies of some EU institutions have led to increase the distance between political parties and society during the period 1985-2005. More industrial and regional development, less taxes on labour, and more support to education and scientific research in all the EU countries are convenient to diminish unemployment and stagnation and to reach real convergence with the USA regarding the increase of real wages and rates of employment at the same time.

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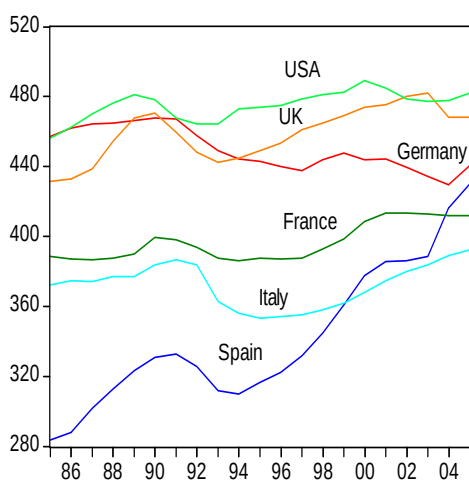
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- On line Annex at the journal web site

Annex

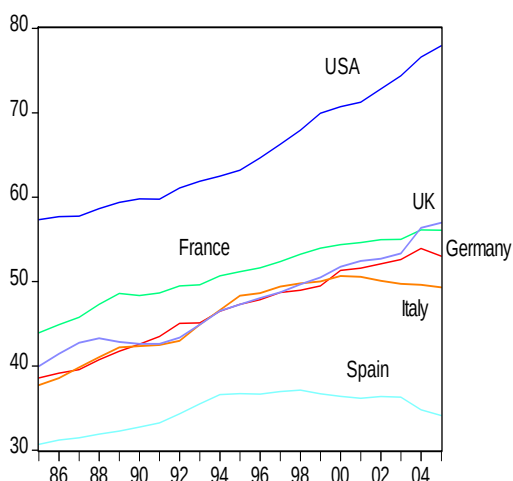
A1. Evolution of Employment rates and labour productivity.

Graphs 5 and 6 show, respectively, the evolution of employment rates and productivity. The USA is at the top in both graphs, followed by UK in year 2005. It is remarkable the high increase of the employment rate in Spain, but on the negative side it has to be interpreted together with the lowering in productivity and wages. The Spanish method to increase the employment rate by diminishing wages is not a good procedure, it is better for EU countries to try to converge towards the highest rates of employment, productivity and wages of the USA.

Graph 5. Employment rates, 1985-2005
(per thousand people)



Graph 6. Productivity per worker
(thousand \$ at 2000 prices and exch. rates)



Source: Own elaboration from OECD Labour Force Statistics

A2. Econometric models

Tables A1 to A4 show the estimation of equations (1) and (3) with a pool of 5 EU countries (Germany, France, Italy, Spain and the United Kingdom) and with data of the United States. Data from OECD(2005a,b) and own elaboration.

The dependent variables of equations A1 and A2 are measured in billion dollars at constant prices (prices of year 2000 in case of A1 and prices of year 1990 in A2). The dependent variables of equations A3 and A4 are measured in thousand employed persons. The ratio $Q/W(-1)$ in equations A3 and A4 is measured in thousand of dollars per unit of wage.

Q_{it} is real Value added of country i in year t , QI corresponds to industry and QNI to non industrial sectors, QM to Manufacturing and QNM to non manufacturing sectors. Variables at constant prices of year 2000 end in 00 while variables in constant prices of

year 1990 end in 90. LT is total employment, PA means Active Population and w^* is the expected value of average wage. For simplification it is assumed that it is proportional to the lagged value of w : $w^*_{it} = \delta w_{i,t-1}$.

Table A1. GLS Estimation of (1) in 5 Eu Countries, 1980-2003
Germany (De), France (Fr), Spain (Es), Italy (It) and UK, 1980-2003

Dependent Variable: QNI00?

Method: Pooled Least Squares

Sample: 1980 2003. Number of cross-sections used: 5

Total panel (unbalanced) observations: 64

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
QNI00?(-1)	1.014795	0.004237	239.4840	0.0000
D(QI00?)	0.330878	0.172014	1.923551	0.0594
DE--AR(1)	0.615509	0.363651	1.692581	0.0960
FR--AR(1)	0.570101	0.289990	1.965932	0.0542
ES--AR(1)	0.781349	0.119537	6.536463	0.0000
IT--AR(1)	0.452892	0.269039	1.683368	0.0978
UK--AR(1)	0.968471	0.100974	9.591271	0.0000
R-squared	0.999673	Mean dependent var	805.3849	
Adjusted R-squared	0.999639	S.D. dependent var	395.1160	
S.E. of regression	7.511109	Sum squared resid	3215.755	
Log likelihood	-216.1540	F-statistic	29046.15	
Durbin-Watson stat	1.717039	Prob(F-statistic)	0.000000	

Note: Data of QNI00 and QI90: non-industrial and industrial real value-added in billion dollars of 2000, elaborated from OECD statistics

The omitted variables are the main cause of autocorrelation and they also affect to the estimated coefficients of the variables included in the equation, accordingly to the effects of missing variables explained in Guisan(2006).

Table A2. LS estimation of (1) for QNM in the United States, 1970-2001

Dependent Variable: QNM90U

Method: Least Squares

Sample(adjusted): 1970 2001

Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
QNM90U(-1)	1.022526	0.002163	472.6765	0.0000
D(QM90U)	0.983216	0.175875	5.590425	0.0000
R-squared	0.998342	Mean dependent var	4062.226	
Adjusted R-squared	0.998286	S.D. dependent var	1035.617	
S.E. of regression	42.87224	Akaike info criterion	10.41479	
Sum squared resid	55140.87	Schwarz criterion	10.50640	
Log likelihood	-164.6366	Durbin-Watson stat	1.567708	

Table A3. GLS estimation for equation (3) in 5 EU countries, 1985-2004

Dependent Variable: LT?

Method: Pooled Least Squares

Sample(adjusted): 1985 2004

Included observations: 21 after adjusting endpoints

Number of cross-sections used: 5

Total panel (balanced) observations: 100

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LT?(-1)	0.999218	0.001989	502.4441	0.0000
D((Q00?)/W00?(-1))	0.128934	0.034025	3.789374	0.0003
D(PA?)	0.507904	0.088159	5.761236	0.0000
AX--AR(1)	0.259918	0.231917	1.120740	0.2653
F--AR(1)	0.459413	0.219619	2.091860	0.0392
E--AR(1)	0.669507	0.205861	3.252224	0.0016
IT--AR(1)	0.662785	0.184092	3.600297	0.0005
UK--AR(1)	0.692582	0.135440	5.113559	0.0000
R-squared	0.999121	Mean dependent var	24149.46	
Adjusted R-squared	0.999055	S.D. dependent var	7518.390	
S.E. of regression	231.1721	Sum squared resid	4916530.	
Log likelihood	-682.0410	F-statistic	14946.32	
Durbin-Watson stat	1.669738	Prob(F-statistic)	0.000000	

Table A4. LS estimation of equation (3) in the USA, 1970-2003

Dependent Variable: LTU

Method: Least Squares

Sample(adjusted): 1970 2003

Included observations: 34 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTU(-1)	0.990840	0.003247	305.1640	0.0000
D(Q90U/W90U(-1))	0.201930	0.044074	4.581593	0.0001
D(PAU)	1.076552	0.182178	5.909354	0.0000
R-squared	0.998115	Mean dependent var	111234.4	
Adjusted R-squared	0.997994	S.D. dependent var	18276.77	
S.E. of regression	818.6338	Akaike info criterion	16.33725	
Sum squared resid	20775000	Schwarz criterion	16.47193	
Log likelihood	-274.7332	Durbin-Watson stat	1.817446	

All the equations show a high goodness of fit and significant coefficients at 5% level with the only exception of the parameter corresponding to D(QI) in table A1, which is significant at the 6% level. The random shock is stationary as expected. Results show evidence in favor of the positive impact of real value-added in industry on non-industrial sectors, particularly in Services. Hence the great importance to improve industrial policies in EU countries as well as human capital and other variables which have proved to have a positive impact on the rates of employment and real wages.