The impact of the Institutions on Regional Unemployment disparities

Floro Ernesto Caroleo, Gianluigi Coppola
caroleo, glcoppola@unisa.it
(Celpe, Centro Interdipartimentale di Economia del Lavoro e di Scienze Economiche
DISES, Dipartimento di Scienze Economiche e Statistiche)

Abstract

The main aim of this paper is to study the European regional disparities in the labour market, considering the regional productive structures and some regional institutional variables. It is widely known that one of the EU's most important stylized facts are the regional disparities among regions. Such differences are related mostly to the income per capita and to the labour market captured through the unemployment rates. In a recent paper (Amendola, Caroleo Coppola, 2004) we analyzed the economic structure of the EU's regions through some proxies of the productive assets and of the labour markets. In this paper we estimate a Panel data where the dependent variable is the regional unemployment rate and the independent variables are some variables related to the productive structure and some regional institutional aspects. The results we obtain confirm that the institutional variables, such as the centralization of wage bargaining, the decentralization of public expenditure and the bureaucracy level, play an important impacts on the unemployment rates.

JEL CODES: R23, C23, H70

Introduction

The problem of the regional disparities is a crucial theme in the debate on the economic and politic process of the construction of the European Union. In fact if we compare the United States with the European Union, we find that the convergence process is slower in the Old Continent. Moreover in the same periods the disparities among regions persist or increase.

As a matter of fact it is possible to find many examples about the persistence of the regional disparities: the unsolved problem of the German unification (Marani, 2004), the absence of growth for many less-developed regions in the Mediterranean Europe (Caroleo e Destefanis 2005), the slow transition of the East European countries (Perugini e Signorelli 2004).

The implications for the economic theory and for the policy issues are very important. In fact there is not a growth theory so far, as for instance the neoclassic theory, the endogenous theory, and the new economic geography, that can fully explain the European case (European Commission 2000; De la Fuente 2000). While, as concerns the political economy aspects, it can be noted how the EU's cohesion policy has not been able to promote the economic integration, prerequisite for the full running of the fiscal and monetary policy of the European Union (Boldrin e Canova 2001; Ederveen e Gorter 2002). In this debate there is an almost unanimous consent in believing that the institutional and economic conditions, acting to regulate the labour market, have important effects on the convergence process. In fact regional convergence is measured in terms of GDP per capita and/or in terms of employment rate and productivity level. The econometric estimates confirm that the slow convergence process and the existence of clusters of homogenous regions in the EU,- converging in their inside, but diverging among them- is caused by the employment rate dynamics (European Commission 2004, for a survey Daniele 2002) and, consequently, by the labour market characteristics. In so far it is important to study those institutional mechanisms that regulate the labour market, as well as the characteristics of the labour demand and supply and their dependence on spatial factors (Nienhur, 2000)

As said before, the employment rate is the variable that may better explain the labour market conditions in the contest of the economic development studies and regional convergence. Since the Lisbon European Council, the European employment strategy itself has defined quantitative objectives based on the employment rate. At the same time a greater number of scientific articles (Marelli 2004 e 2005; Garibaldi e Mauro 2002) have studied the regional disparities by analyzing this variable.

On the other side, according to a wide consensus born in Europe and influenced by the OECD's prescriptions, the Eurosclerosis problem in the Nineties is seen as the consequence of the institutional rigidities in the European labour market that have caused the growth of the equilibrium unemployment. The underlined theory of these thesis shows the existence of a structural unemployment rate, that is the equilibrium rate to which the labour market converges when, in absence of exogenous shocks, all prices and wages are completely adjusted (Layard et al. 1991). In this framework, the empirical analysis tries to demonstrate how the different unemployment dynamics of the European countries depend mostly on micro-level real labour market frictions, such as the wage bargaining power of the workers and/or of the unions, the information and incentive at firm-level, the job search and matching efficiency (Nickell, 1997; Nickell e Layard, 1999; Blanchard e Wolfers, 2000; for a survey see also Caroleo, 2000).

The basic idea of this study is that the regional and/or national disparities in Europe are caused both by the different productive structure and by technological and economic conditions that determines the employment levels, and also by different institutional assets of the labour market. In other words we think that those factors may contribute to create or to sustain the divergence or persistence of disparities among regions.

The next paragraph contains some stylized facts that show how the unemployment rate is able to better represent the regional differences in the labour market. In the third paragraph we list the variables chosen to explain the functional relationship between the unemployment rate, as the dependent variable, and the productive structure and the institutional assets. Furthermore we explain the methodology used to obtain those variables (§ 3). In the last paragraph the results of the econometric estimations are reported. The conclusions contain some final comments.

1. The stylized facts

The most important stylized fact in the European Union is shown in the graphs 1 and 2, where are represented the index number of the mean, mean square error, and coefficient of variation of the employment rate (graph 1), and of the unemployment rate (graph 2) relating to 130 European regions for the period 1991 to 2000. We can observe two important stylized facts: the first one is that in the Nineties the unemployment rate has shown a higher cycle than the employment rate, and the other one is that the variability of the unemployment rate at regional level has been higher than the employment rate.

Figure 1. The rate of Employment: Mean, Mean Square Deviation, Coefficient of variation
Years 1991-2000

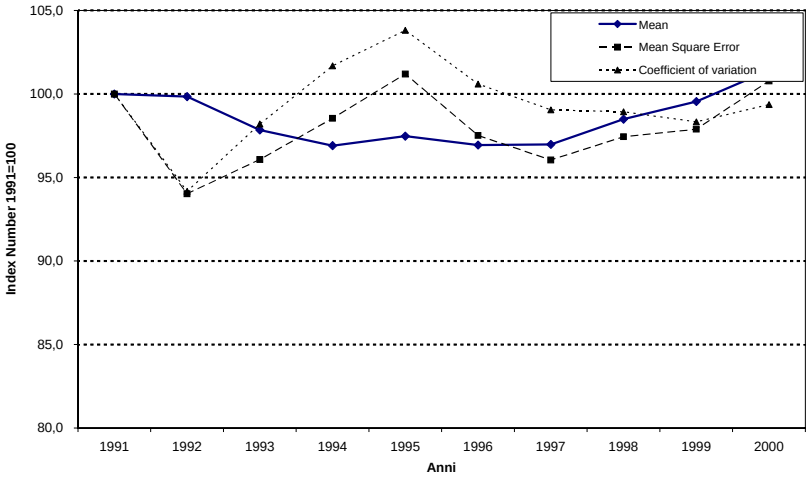
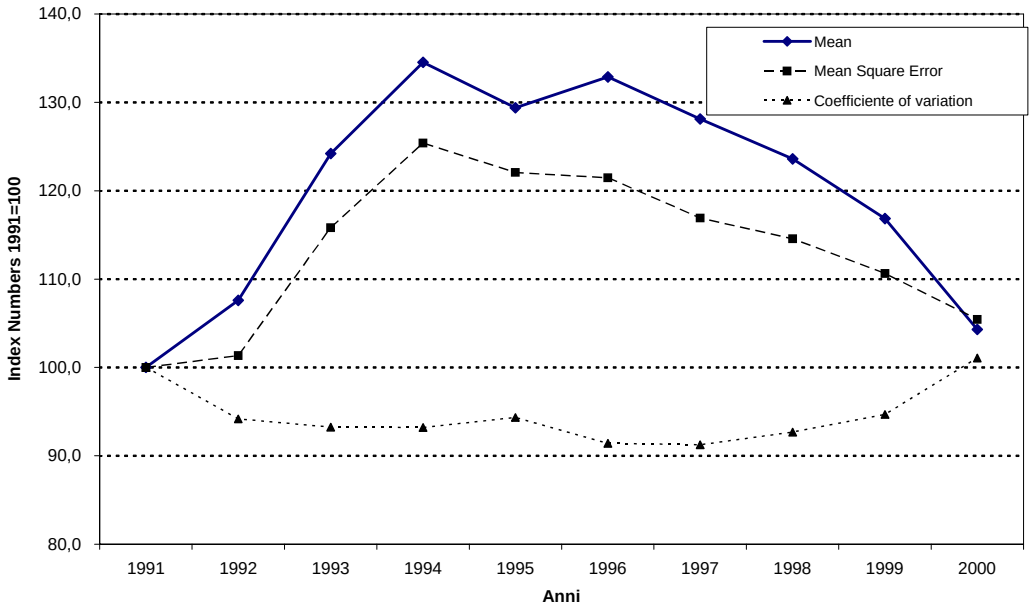


Figure 2. The Unemployment rate: Mean, Mean Square Deviation, and Coefficient of variation. Years 1991-2000. Index Number 1991=100



This second stylized fact leads us to find those variables that affect the unemployment rate in order to analyze the regional disparities. Elrhost (2000) makes a list of some regional variables concerning with the labour market that may cause divergence processes among regions. They can

be synthesized in the different endowment in the product factors and in the "*fundamentals"*; in the different local labour market structure (Genre e Gòmez-Salvador, 2002) –demographic growth, population age-structure, migration and commuting (Greenway, Upward e Wright, 2002); in the employment levels; in the productive structure (Marelli, 2003; Paci e Pigliaru, 1999; Paci, Pigliaru e Pugno, 2002); in the demographic density and urbanization (Taylor e Bradley 1997); in the economic and social barriers; in the human capital; in the institutional structure regulating the good markets and the labour market, and also the wages composition (Pench e Sestito e Frontini,1999; Hyclack e Johnes 1987).

Without expecting to be exhaustive, we want to test some of the theses above mentioned. To this end we want to estimate the relationship between the unemployment rate, measured at the regional level, and a set of variable that includes some institutional indicators and the most important regional economic characteristics.

2. The set of the independent variables.

The set of the independent variables used in our analysis may be classified into three groups: (a) productive structure and labour market indicators, (b) institutional indicators and (c) variables of the economic performance.

Indicators of the productive structure and labour market

We begin to estimate a proxy of the labour market and productive structures of the regions. To this end, we calculate two indicators by applying a dynamic multivariate factorial analysis. This method is very useful to study multidimensional phenomena like the regional disparities. In fact the regions (cases) may be analyzed on the base of a set of indicators (variables) that change over the years (time).

We choose (Amendola, Caroleo, Coppola 2004) to apply the STATIS (Structuration des Tables A Trois Indeces de la Statistique) method (Escoufier 1985 e 1987). This is a dynamic multivariate method that is able to cluster the regions for several years on the base of a set of variables including indicators of labour market and income, variables of the composition of the population and of the structure of the productive sector. In this way it is possible to study the interaction chances between the labour market structure and the economic growth over time. In this contest, it is also possible to analyze the dynamics of the regions.

The variables used for this analysis are listed in Table 3.2. They are taken from the Eurostat REGIO database and the European regions database of Cambridge Econometrics Ltd. and they are, as said, indicators characteristic of the labour market and the production system (Wishlade and Yuill, 1997). The labour demand is measured by the unemployment rate on the total working-age population (TOT), while the labour supply is measured by the labour-force participation rate (TAT). The percentage of the long-term unemployed (ULR) is used as a proxy for the structural gap between labour demand and supply. The percentage of part-time employment (PTT) is used as a measure of the flexibility of the regional labour market.

The production system is represented by four variables corresponding to the percentages of employed persons in agriculture (AGR), industry (IND), traditional services – commerce, hotels and non-market services (GHM) – and advanced services – transport, financial services and others (IJA). The other variables considered are population density (DEN), as a proxy for the gravitational force of a region, and per capita income (PPS), which is the indicator most frequently used to represent regional disparities.

Table 1 Variables used in the STATIS analysis			
N	Code	Variable	Index
1	DEN	Population density	Inhabitants /sq km
2	TAT	total activity rate	labour force/population aged over 15
3	TOT	employment rate	employed/population aged over 15
4	ULR	Long-term unemployment rate	long-term unemployed/total unemployed
5	PTT	part-time employment rate	part-time employed/total employed
6	AGR	percentage employment in agriculture	employed in agriculture/ total employed
7	IND	percentage employment in industry	employed in industry/total employed
8	GHM	percentage employment in traditional services	employed in retail trade, hotels and non-market services /total employed
9	IJA	percentage employment in advanced services	employed in transport, financial and other services/total employed
10	PPS	per capita income	per capita GDP in Purchasing Power Standard

The European regions represent 130 cases. The level of the territorial disaggregation of the European regions selected was intended to cover the entire territory and to provide the maximum disaggregation possible with the data available. This level corresponds to the Nuts 2 level for Greece, Spain, France, Italy, Austria and Portugal; Nuts 1 for Belgium, Germany, Holland, Finland, the United Kingdom; Nuts 0 for Denmark, Ireland, Luxembourg and Sweden, for which countries there are no Nuts 1 and Nuts 2 disaggregations (or data are not available with which to perform such disaggregations)[1]. The time period is 1991- 2000.

The STATIS methodology, as said, consists in the analysis of the three-way matrix (tXij), where t denotes the temporal observations, i the regions, and j the variables (i=1,2...I; j=1,2...J; t=1,2...T), obtained by the succession of T matrices ${}_{t}X_{i,j}$ of the same dimensions.

The analysis moves through three phases: interstructure, compromise and infrastructure. The output from the interstructure phase describes the structure of the *T* matrices in a vectorial space

smaller than T. This is reduced to two dimensions but still maintains a good similarity to the initial representation. The compromise phase consists in the estimation of a synthesis matrix which yields a representation, in the two-dimensional space identified, of the characteristic indicators and of the average positions of the regions in the time-span analysed (1991-2000). The result of this intrastructure phase is a representation of the trajectories followed by the individual regions in the same period of time.

Table 2
Eigenvalues and inertia percentages of the factorial axes

Axis	Eigenvalue	Variance explained	Cumulated variance explained
1	3.75547	36.76	36.76
2	1.99895	19.56	56.32
3	1.18853	11.63	67.95

In order to evaluate the goodness of the factorial representation yielded by construction of the compromise matrix, Table 2 shows the first three highest eigenvalues and the percentage of the total variance explained by the first three factorial axes.

To be noted first is that 36.8% of the variance is explained by the first factor, and 19.6% by the second, for a total of 56.3% of the variance expressed by the set of all the variables. In other words, the first factor alone explains more than one-third of the total variability, while the first three factors jointly explain almost 68%. Consequently, the reduction of the phenomenon's variability, obtained by representing it in a two-dimensional space, is a meaningful synthesis of the information considered.

In order to interpret the two figures, we may refer to Table 2, which shows that minimum and maximum period values of the correlations between the variables and the factorial axes. It will be seen that the variables most closely correlated with the first factor are, on the one hand, the employment rate (TOT), the activity rate (TAT), the percentage of part-time employment (PTT), per capita income (PPS), and the percentage of employment in advanced services; and on the other (positive quadrant), the percentage of long-term unemployment (ULR), and the percentage of

[1] The complete list of the 130 regions is given in the Appendix.

employment in agriculture (AGR). In other words, along the first axis one observes a clear polarization between the labour market indicators and those relative to the production structure.

Along the second axis one observes a close correlation among, on the one hand, population density (DEN), per capita income (PPS), and the percentages of employment in traditional services (GHM) and advanced services (IJA), and on the other, percentage of employment in industry (IND) and in agriculture (AGR), and the employment rate (TOT). In this case, we may state that the second axis identifies in marked manner only the phenomena representing variables located in the positive quadrant, namely those correlated with the territorial dimension. In fact, the indicators in this quadrant represent highly urbanized areas, or ones which contain rail or road infrastructures or sea ports, or with high levels of tourism. The negative quadrant, by contrast, comprises indicators which are more difficult to interpret and concern a mix of factors, such as low population density, the presence of agricultural employment, and high levels of industry[2].

Table 2
Correlations between the variables and the factorial axes (minimum and maximum period values)

Factor 1			Factor 2			Factor 3		
	Min	Max		Min	Max		Min	Max
TAT	-0.83	-0.75	IND	-0.51	-0.47	IND	-0.77	-0.71
TOT	-0.78	-0.72	TOT	-0.42	-0.37	PPS	-0.36	-0.27
PTT	-0.76	-0.69	AGR	-0.36	-0.34	ULR	-0.18	0.07
PPS	-0.69	-0.63	TAT	-0.34	-0.30	GHM	-0.09	-0.04
IJA	-0.66	-0.64	PTT	-0.11	-0.03	TOT	0.14	0.25
IND	-0.34	-0.22	IJA	0.27	0.30	IJA	0.14	0.20
DEN	-0.30	-0.29	ULR	0.30	0.38	DEN	0.15	0.16
GHM	-0.17	-0.07	PPS	0.33	0.36	TAT	0.19	0.32
ULR	0.58	0.64	GHM	0.64	0.73	PTT	0.21	0.33
AGR	0.70	0.72	DEN	0.73	0.73	AGR	0.47	0.49

Source: Our calculations on Eurostat REGIO data and on the Cambridge Econometrics database

In conclusion the European regions seem to place along the two factorial axes that represent some characteristics of the labour market and the productive structure. The first factor (**FF**) can be interpreted as a proxy of the “bad” performance of the labour market. It is useful to point out that the variable has an opposite sign with respect to development factor: the regions that have a good performance in term of activity rate and employment rate, and higher income per capita levels, have

[2] see Amendola, Caroleo Coppola 2004) for a more complete analysis.

negative value of this factor. On the contrary those regions that have low activity and employment rates and a high percentage employed in agriculture.

The second factor (**SF)** may be interpreted as a factor that is positive correlated with the urbanization and a high developed tertiary sector.

Institutional Variables

If the first factor, obtained by STATIS, may be interpreted as the level of efficiency and of flexibility of the labour market, a further indicator of the rigidity/flexibility of the labour market may be found in the degree of decentralization of those institutions regulating the labour market and, particularly, the level of wage bargaining centralization (Calmfors, 1993; Calmfors e Driffil, 1988).

For a long time, the "European model" has been characterized by wage bargaining strictly related with the industrial relations, or rather, with an institutional framework aimed at the employment protection, centralized, universalistic and egalitarian. Nevertheless in the last years many things have changed. A new trend, regarding the need to decentralize the labour market policies at a sub national level (i.e. regional), has been developed according to the thesis that considers the participation in bargaining by the local institution as a way to reach a higher level of regional cohesion in the EU (Buti, Pench e Sestito, 1998; Soltwedel, Dohse e Kreige-Boden, 1999).

Usually the debate on bargaining has been focused on the centralized or decentralized wage bargaining as a vertical kind of bargaining (i.e from national to firm level) (Freeman e Gibbson 1993). The firm-level bargaining is considered by the OECD (OECD,1999) the only one that may reduce the regional disparities since it binds the bargained wage to the different local labour market conditions and to the different regional labour productivity (for the Italian case see Antonelli e Paganetto (1999), Biagioli, Caroleo and Destefanis (1999) and, more recently, Dell'Aringa (2005)).

There are many possible objections to this approach. As a matter of fact it has been pointed out that there is a variety of bargaining modalities (bargaining at regional level or by skills) and, on the other side, that there is a coordination problem (Amendola, Caroleo e Garofalo, 1997).

If we consider these two aspects together, it is possible to show that the economic performance can be improved both by a centralized and by a decentralized bargaining.

It may be useful to underline that the bargaining decentralization cannot be separated from the industrial relation assets. This crucial aspect is important in order to better understand the reasons of a bargaining reform aimed at decentralizing the wage bargaining, but that at the same time takes into account the different institutional framework and the coordination issues

In other words the industrial relations concern that security system built up to protect the employment like the security (i) against the risk of the future unemployment and the job precariousness, (ii) against the barriers to the Human capital development, (iii) against the restriction on the right to work and against the (iv) low representativeness of the workers.

These industrial relations should be adjusted according to the characteristics of the local labour markets. In fact, the labour market policies are aimed at implementing active policies that are appropriate to the different local labour market characteristics, with also different applicatory approaches that involve several actors and procedures.

A decentralized industrial relations system need to go beyond a mere decentralization of the administrative bureaucratic system. It should involve the most important local actors, implement shared actions with shared responsibilities (Regini, 2002, Arrighetti e Seravalli, 1999).

This is the only way to obtain a kind of employment growth that is both quantitative and qualitative, or, in other words, to make more flexible the labour market without loosing the necessary securities.

For this reason the new approach of decentralization of the industrial relations has been interpreted as a tendency to the local and territorial “negotiations “ that assumes the form of a pact among the interested social parts.

For our analysis it would be useful to find, as a proxy of the institutional decentralization of the labour market, a variable related to the level of decentralized bargaining and to the degree of the regional industrial relations system. Unfortunately, homogeneous data at the European level are not available, therefore we can only use the traditional indicator of the bargaining centralization

(**CENTR**) that combines the levels of wage bargaining centralization with the wage coordination among the most important trade unions (Checchi e Lucifora 2002; Boeri, Brugiavini e Calmfors 2002).

The underlying hypothesis is that if the trade union bargains the wage at the level of the single firm it will better take into account the firm productivity level, that surely is affected by the local economic conditions.

A further institutional aspect considered in our analysis is the administrative decentralization of the public administration. We choose two indicators for this aspect: the first one is the degree of centralization of public expenditure (**CFG)** and the second one is an index of bureaucracy **(BUREAUCRACY)**. The first one has been calculated as the ratio between the expenditure of the central administration over the total public expenditure[3]. The lower is this ratio, the higher it will be the percentage of the expenditure of the local administration. The ratio represents, in our opinion, a good proxy of the decentralized power of the public expenditure at the regional level. The index of bureaucracy is not disaggregated at national level, and can be considered as a proxy of the Public Administration efficiency[4].

Variables or the economic performance of the regions

The third group of variables contains two wide-used regional development indexes: the percentage variation of the Gross Value Added at constant price (GRPR) and the investment per capita, measured as investment per inhabitants (**INVPOP**)[5][6].

[3] The variable has been calculated as the ratio between the total expenditure minus the local expenditure over the total expenditure. (Fonts: IMF Government Finance Statistics Yearbook & supplement Finance statistics Yearbook 2003).

[4]This variable is contained in the data bank www.countrydata.com and it is an indicator of a quality of bureaucracy at national level.

[5]The last two variables are from European Regions databank of the Cambridge Econometrics Ltd of the.

[6]The values of the variables CENTR, CGF, BUREAUCRACY are at national level and we suppose that they are the same for the regions of a same country. In the Econometric estimations we do not consider Luxembourg (1 region), Greece (13 regions) and Portugal (7 regions). The regions excluded by the econometric analysis are 21 since for these countries the variable CENTR is not available.

List of the Dependent Variables	
Acronym	**Variables**
CONS	Constant
FF	Index factor of the labour market's performance *(the variable has an opposite sign related to development's index)*
SF	Index factor of tertiary/urbanization
CENTR	bargaining centralization index
CGF	level of public expenditure centralization
BUREAUCRACY	Bureaucracy' index
GDPG	GDP annual growth at constant price
INVPOP	investment/population

3. The Estimation Method: The Panel Data analysis

Our dataset is a Panel Data where the cases are the regions e the time units are the years from 1991 to 2000. For this reasons we apply the Panel data econometric methods to study the relationship between the unemployment rate and the set of the independent variables

The model may be written as

$$y_{it} = \alpha_0 + x_{it}^{'}\beta + z^{'}\alpha + \varepsilon_{it} \qquad [1]$$

where $i = 1,.....n$, $t = 1,.....T$. a_0 is the constant, β is the vector of coefficients, x_{it} contains K regressors and the matrix z_{it}, is a set of not observable variables that captures the specific effects related to the characteristics of the individuals that are, in our study, 109 European regions[7]. ε_{it} is the error term.

The variables in z_{it} are not observed and may be correlated or not correlated with the regressors. In the first case in the model [1] the intercept is group specific and it is constant over the time. This is the Fixed Effects model and may be written as:

$$y_{it} = a_0 + x_{it}^{'}\beta + \alpha_i + \varepsilon_{it} \qquad [2]$$

[7] As we say before, the variable CENTR is not available for some nations.

In the second case the model is defined as a Random Effects model. The variables of the matrix z_{it} are unobservable and uncorrelated with the x_{it}. In this case the model becomes

$$y_{it} = \alpha_0 + x_{it}^{'}\beta + u_i + \varepsilon_{it} \qquad [3]$$

where u_i is the group-specific stochastic term.

The difference between the fixed effect and the random effect model is in the nature of the individual component α_i (in the fixed model) and u_i in the random model. In the fixed effects model, α_i is deterministic and captures the individual characteristics. It assumes different values for each single individual, it is constant over time and, being related with the characteristics of the individual, is correlated with the variables x_i. In the Random Effects model, the term u_i has a group specific random distribution. The term u_i is a stochastic variable and is not correlated with the x_i, because these variables are not stochastic.

The Fixed Effect model is reasonably used for territorial – intercountry or interregional – comparisons, as in our case, as we can plausibly suppose that the not observed characteristics captured in the variables are constant over the time (Green, 2003). Anyway we can test what is the better specification – fixed effect or random effect – by the Hausmann test[8].

The model estimated is the following one:

$$UNRATE_{it} = a + \beta_1 FF_{it} + \beta_2 SF_{it} + \beta_3 GDPR_{it} + \beta_4 INVPOP_{it} + \beta_5 BUREAUCRACY_{it} + \\ + \beta_6 CENTR_{it} + \beta_7 CGF_{it} + \beta_8 CGF2_{it} + \nu_i + \varepsilon_{it}$$

where a is the constant, $\beta_1 \ldots\ldots \beta_8$ are the parameters, υ_i is the individual component and ε_{it} the error term. The acronyms of the variables are reported in the previous list. The variable that measures the level of public expenditure centralization (CFG) is considered also in its quadratic

[8] This Test is based on the statistics $W = (\beta_f - \beta_r)'(V_f - V_r)^{-1}(\beta_f - \beta_r)$ where β_f and β_r are respectively the fixed effects and the random effect coefficients and V_f, V_r. are their relative variance-covariance matrixes. Under the null hypothesis the statistics *W* is distributed as a $\chi^2(k)$ where *k* is the number of coefficients in β, intercept excluded. The null hypothesis in no correlation between the stochastic term and x_{it}, and so the absence of any systematic difference between the Random effects and fixed effects coefficients. In the first case Random Effects are

form (CFG2) in order to test the hypothesis of a quadratic relationship of this variable with the unemployment rate and, consequently, the existence of an optimal dimension in the degree of centralization of public expenditure.

Results

The Table 4 contains the results. In the third and fourth columns are reported respectively the Random Effects and the Fixed Effects estimates. For sake of completeness this table includes also the OLS estimation (column 1) and the Random effect model results obtained by the Maximum Likelihood Estimation (columns 1).

The signs of the coefficients, obtained by the four estimation methods, are always the same. The Hausmann test does not accept the null hypothesis of absence of correlation between the dependent variables and the error terms. This is the fundamental hypothesis of the Random effects model, and being not accepted, we can conclude that the Fixed Effect model is the well specified model.

The result confirms the theories of the previous paragraphs. Particularly in the Fixed Effect Model the coefficients are all statistically significative and they have the expected sign. Only the variable GDPR – the annual growth rate of the gross value added per capita- is significative only at the 8%.

The dependent variables are expressed in different measures. Accordingly, in order to compare the dimension of their effects on the unemployment rate, we calculate the standard coefficients[9] of the variables and the elasticity to their mean value (tab. 5) [10].

---

better than Fixed Effects because the Random Effects are more efficient. In the opposite case the Fixed Effects are consistent.

[9] A standard coefficient is equal to $\beta^{s}_{x_i} = \beta_{x_i} \frac{s_{x_i}}{s_y}$ where β_x is the parameter of the variable x_i, s_x and s_y are respectively the standard deviations of the variable x_i and *y*. It may be useful to make an example to better understand the meaning of the standard coefficients. The standard coefficient of the variable SF (Table 5) is 0.6; this means that a unit standard deviation of SF causes a standard deviation of the unemployment rate equal to 0.6.

[10] The elasticity of an independent variable to its mean value is $E_x = \beta_x \frac{\overline{X}}{\overline{Y}} = \frac{\partial X}{\partial Y} \frac{\overline{X}}{\overline{Y}}$. It may be useful to point out that the standard coefficients, even if they are more difficult to analyse, are constant for all the values of the relative

Summary and Conclusions

The results obtained seem to confirm our initial thesis: the unemployment rate is correlated with the decentralization level of the wage bargaining, with the institutional efficiency of the regions, and also with the bureaucracy level, even if the impact of this variable on the unemployment rate is small.

The centralization level of the public expenditure has a quadratic relationship with the unemployment rate. This means that the unemployment level grows together with the public expenditure centralization degree, but in a less than proportional way, until a value of the centralization ratio equal to 75%. After that value the unemployment decreases. Nevertheless, we need to be cautious in interpreting this result since the sign of the variables CGF and CFG2 is opposite in the OLS Method.

Also the economic performance of the regions – measured by the GDP growth and the investment per capita (INVPOP) –has a negative impact on the unemployment rate. The second variable has a standard coefficient that is double compared with the first one.

We find also interesting the value of the two structural factors coefficients. In fact, as it can be easily supposed, the unemployment rate is negatively correlated with the good performance of the regional labour market (high activity and employment rate, high share of employment in the industrial and in the advanced services sector) measured by the first factor (FF).

Even if it is more difficult to explain the positive relationship between the unemployment rate and the second factor that is related to the high share of the services and high demographic density. In this case the results seem to confirm the empirical evidence - reported also in the third Progress Report on Economic and Social Cohesion in the EU – that the "*cities act as centres of employment for a widely-drawn population, with one in every three jobs being taken by someone commuting into the city"* (Commission of the European Communities, Third Progress Report on Cohesion, page 22). For this reason the unemployment and social problems in the European Union assume a higher

independent variable. On the contrary, in our estimations the elasticity of a dependent variable is not constant because the model is linear.

relevance in Urban centres as well as in the tertiary process that nowadays characterizes the EU economic development.

.

Table 4
Results of the Panel Data Estimation
Dependent Variable: Unemployment rate

	(1)		(2)		(3)		(4)	
	OLS		MLE		Random Effects		Fixed Effects	
	coefficient	P-level	coefficient	P-level	coefficient	P-level	coefficient	P-level
CONS	10.763	0.01	-16.871	0.00	-12.303	0.00	-24.931	0.00
FF	2.233	0.00	1.706	0.00	1.849	0.00	1.183	0.00
SF	1.388	0.00	1.784	0.00	1.578	0.00	2.633	0.00
GDPR	0.181	0.00	-0.046	0.02	-0.044	0.04	-0.037	0.08
INVPOP	-0.002	0.01	-0.002	0.00	-0.002	0.00	-0.001	0.00
BUREAUCRACY	2.646	0.00	1.855	0.00	2.064	0.00	1.558	0.00
CENTR	-0.083	0.00	0.047	0.00	0.029	0.01	0.077	0.00
CGF	-0.179	0.02	0.528	0.00	0.402	0.00	0.753	0.00
CFG2	0.001	0.13	-0.004	0.00	-0.003	0.00	-0.005	0.00
Num. obs.	1090		1090		1090		1090	
Num. groups			109		109		109	
R2	0.5777							
R2corr	0.5746							
F(8,1081)	184.87	0.00						
Log likelihood			-2399.9584					
LR chi2(8)			378.58	0.00				
R-sq within					0.2704		0.2929	
R-sq between					0.4689		0.2909	
R-sq overall					0.4466		0.2861	
Random effect u_i								
Corr(u_i,X)					0		-0.392700	
Sigma u					3.1659		5.289283	
Sigma e					1.7714		1.771356	
rho (% of the variance due to u)					0.7616		0.899155	
Wald chi2(8)					479.46			
F(8,973)							50.39	0.000
Hausmann Test (Ho : corr (ui, X)=0) CHI2 (8); Prob>CHI2							113.92	0.000

Table 5
Mean, Standard deviation,
coefficients, (fixed effect), standard coefficients, elasticity at mean value

Variable	Mean	s.d .	parameter	c s	el
UNEMPLOYMENT RATE	10.885	6.064			
CONSTANT			-24.931		
FF	-0.300	1.766	1.183	0.344	-0.033
SF	0.171	1.384	2.633	0.601	0.041
GDPR	2.029	3.260	-0.037	-0.020	-0.007
INVPOP	50.239	178.694	-0.001	-0.044	-0.007
BUREAUCRACY	3.974	0.143	1.558	0.037	0.569
CENTR	25.747	16.247	0.077	0.207	0.183
CGF	73.082	8.256	0.753		
CGF2	5409.132	991.429	-0.005	0.199	0.289

APPENDIX

The 130 European regions.			
sigla	Regioni	sigla	Regions
	Belgium – NUTS 1 – Regions		
be1	Région Bruxelles-capitale/Brussels hoofdstad gewest	be2	Vlaams Gewest
be3	Région Wallonne		
dk	**Denmark – NUTS 0 – Nation**		
	Federal Republic of Germany (including ex-GDR from 1991) - NUTS 1 – Lander		
de1	Baden-Württemberg	de2	Bayern
de3	Berlin	de4	Brandenburg
de5	Bremen	de6	Hamburg
de7	Hessen	de8	Mecklenburg-Vorpommern
de9	Niedersachsen	dea	Nordrhein-Westfalen
deb	Rheinland-Pfalz	dec	Saarland
ded	Sachsen	dee	Sachsen-Anhalt
def	Schleswig-Holstein	deg	Thüringen
	Greece – NUTS 2 – Development regions		
gr11	Anatoliki Makedonia, Thraki	gr12	Kentriki Makedonia
gr13	Dytiki Makedonia	gr14	Thessalia
gr21	Ipeiros	gr22	Ionia Nisia
gr23	Dytiki Ellada	gr24	Sterea Ellada
gr25	Peloponnisos	gr3	Attiki
gr41	Voreio Aigaio	gr42	Notio Aigaio
gr43	Kriti		
	Spain – NUTS 2 – Comunidades autonomas		
es11	Galicia	es12	Principado de Asturias
es13	Cantabria	es21	Pais Vasco
es22	Comunidad Foral de Navarra	es23	La Rioja
es24	Aragón	es3	Comunidad de Madrid
es41	Castilla y León	es42	Castilla-la Mancha
es43	Extremadura	es51	Cataluña
es52	Comunidad Valenciana	es53	Baleares
es61	Andalucia	es62	Murcia
es63	Ceuta y Melilla (ES)	es7	Canarias (ES)
	France – NUTS 2 – Régions		
Fr1	Île de France	fr21	Champagne-Ardenne
Fr22	Picardie	fr23	Haute-Normandie
Fr24	Centre	fr25	Basse-Normandie
Fr26	Bourgogne	fr3	Nord - Pas-de-Calais
Fr41	Lorraine	fr42	Alsace
Fr43	Franche-Comté	fr51	Pays de la Loire
Fr52	Bretagne	fr53	Poitou-Charentes
Fr61	Aquitaine	fr62	Midi-Pyrénées
Fr63	Limousin	fr71	Rhône-Alpes
Fr72	Auvergne	fr81	Languedoc-Roussillon
Fr82	Provence-Alpes-Côte d'Azur	fr83	Corse
Ie	**Ireland – NUTS 0 – Nations**		
	Italy – NUTS 2 – Regioni		
It11	Piemonte	it12	Valle d'Aosta
It13	Liguria	it2	Lombardia
It31	Trentino-Alto Adige	it32	Veneto

It33	Friuli-Venezia Giulia	it4	Emilia-Romagna
It51	Toscana	it52	Umbria
It53	Marche	it6	Lazio
It71	Abruzzo	it72	Molise
It8	Campania	it91	Puglia
It92	Basilicata	it93	Calabria
Ita	Sicilia	itb	Sardegna
Lu	Luxembourg		
	Netherlands – NUTS 2 – Provincies		
nl1	Noord-Nederland	nl2	Oost-Nederland
nl3	West-Nederland	nl4	Zuid-Nederland
	Austria – NUTS 2 – Bundesländer		
at11	Burgenland	at12	Niederösterreich
at13	Wien	at21	Kärnten
at22	Steiermark	at31	Oberösterreich
at32	Salzburg	at33	Tirol
at34	Vorarlberg		
	Portugal - NUTS 2 groupings		
pt11	Norte	pt12	Centro (P)
pt13	Lisboa e Vale do Tejo	pt14	Alentejo
pt15	Algarve	pt2	Açores (PT)
pt3	Madeira (PT)		
	Finland- NUTS 1 – Manner-Suomi/Ahvenanmaa		
Fi1	Manner-Suomi	fi2	Åland
se	**Sweden- NUTS 0 – Nation**		
	United Kingdom –NUTS 1 – Nation		
ukc	North East	ukd	North West (including Merseyside)
uke	Yorkshire and The Humber	ukf	East Midlands
ukg	West Midlands	ukh	Eastern
uki	London	ukj	South East
ukk	South West	ukl	Wales
ukm	Scotland	ukn	Northern Ireland

References

Amendola A., Caroleo F.E., Coppola G., (2005) *Regional Disparities in Europe* in Caroleo and Destefanis (eds), (2005) *Regions, Europe and the Labour Market. Recent Problems and Developments*, Physica Verlag, Heidelberg.

Amendola A., Caroleo F.E., Garofalo M. (1997), "Labour Market and Decentralized Decision Making: an Institutional Approach", *Labour*, (11), 3, 497-516.

Antonelli G., Paganetto L. (a cura di) (1999), *Disoccupazione e basso livello di attività*, il Mulino, Bologna.

Arrighetti A., Seravalli G. (a cura di) (1999), *Istituzioni intermedie e sviluppo locale*, Donzelli, Roma

Biagioli M., Caroleo F. E., Destefanis S. (eds.) (1999), "Introduzione" a *Struttura della contrattazione, differenziali salariali e occupazione in ambiti regionali*, ESI, Napoli.

Blanchard O., Wolfers J. (2000), "The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence", *Economic Journal*, March. C1-C33.

Bodo G., Sestito P. (1991), *Le vie dello sviluppo*, il Mulino, Bologna.

Boeri T., Brugiavini A., Calmfors L. (2002) *Il ruolo del sindacato in Europa*, Università Bocconi Editore, Milano.

Boldrin M. and Canova F. (2001), "Inequality and Convergence in Europe's Regions: Reconsidering European Regional Policies", *Economic Policy*, April 2001.

Buti M., Pench L. R., Sestito P. (1998), "European Unemployment: Contending Theories and Institutional Complexities" , DGII, Working paper n. 81, Brussels.

Perugini C., Signorelli M., (2004)" Employment Performance and Convergence in the European Countries and Regions", *The European Journal of Comparative Economics*, vol. 1, n. 2, 2004, pp. 243-278) .

Calmfors L. (1993), "Centralization of Wage Bargaining and Macroeconomic Performance: a Survey", *OECD Economic Studies*, n. 2, 161-191.

Calmfors L., Driffill J. (1988), "Bargaining Structure, Corporatism and Macroeconomic Performance", *Economic Policy*, 6, 15-61.

Caroleo F.E. (2000), "Le politiche per l'occupazione in Europa: Una tassonomia istituzionale", *Studi Economici*, n. 71, 2, 115-152.

Caroleo F. E., Destefanis S. (eds) (2005) *Regions, Europe and the Labour Market. Recent Problems and Developments*, Physica Verlag, Heidelberg.

Checchi D., Lucifora C., (2002), "Unions and labour market institutions in Europe", *Economic Policy* 2002, 362-408

Daniele V. (2002), "Integrazione economica e monetaria e divari regionali nell'Unione Europea" *Rivista economica del Mezzogiorno*, 3:513–550.

De la Fuente A (2000), "Convergence across countries and regions: theory and empirics", *European Investment Bank Papers* 2.

Dell'Aringa C. (2005), "Industrial Relations and Macroeconomic Performance" , *Paper presentato alla Conferenza Internazionale su* "Social Pacts, Employment and Growth: A Reappraisal of Ezio Tarantelli's Thought", Roma.

Ederveen S., Gorter J. (2002), "Does European Cohesion Policy Reduce Regional Disparities? An empirical Analysis", CPB Netherland Bureau for Economic Policy Analysis, CPB Discussion Paper, n. 15.

Elhorst JP. (2000), "The mystery of regional unemployment differentials: a survey of theoretical and empirical explanations" *Research Report 00C06*, University of Groningen, Research Institute SOM-Theme C: Coordination and Growth in Economics.

Escoufier Y. (1985), "Statistique et analyse des données", *Bulletin des Statisticiens Universitaires 10*.

Escoufier Y. (1987), *Three-mode data analysis: the Statis method*. in Methods for multidimensional data analysis, European Courses in Advanced Statistics.

European Commission (2000), *Real convergence and catching up in the EU*, in the EU economy: 2000 Review, European Commission, Luxembourg.

European Commission (2004), "A New Partnership for Cohesion: Convergence, Competitiveness, Cooperation", *Third Report on Economic and Social Cohesion*, Brussels.

European Commission (2005), *Third Progress Report on Cohesion*, Brussels

Freeman R. B., Gibbson R. (1993), "Getting Together and Breaking Apart: the Decline of Centralized Collective Bargaining", *NBER Working Paper*, n. 4464, Cambridge, Mass.

Garibaldi P. and Mauro P., (2002), "Anatomy of Employment Growth", *Economic Policy*, Vol. 17, pp. 67-113.

Genre V, Gòmez-Salvador R., (2002), "Labour force developments in the Euro area since the 1980s". ECB Occasional Paper Series 4.

Greenway D, Upward R., Wright P. (2002), "Structural adjustment and the sectoral and geographical mobility of labour. Leverhulme Centre for Research on Globalisation and Economic Policy" *Working Paper n.3*, University of Nottingham.

Green W. H., (2003), *Econometric Analysis*, Fifth edition, Prentice Hall International Edition

Hausman J. (1978), "Specification Tests in Econometrics", Econometrica, 46, 1978, pp.1251-1271

Hyclak T, Johnes G., (1987), "On the determinants of full employment unemployment rates in local labour markets", *Applied Economics* 19:615–645.

International Monetary Found *Government Finance Statistics Yearbook* & *Supplement Finance statistics Yearbook*, 2003

Layard R., Nickell S., Jackman R., *Unemployment. Macroeconomic Performance and the Labour Market*, Oxford University Press, Londra, 1991.

Marani U. (a cura di) (2005), *L'economia della Germani Unificata: uno sguardo interessato dal Mezzogiorno d'Italia*, Donzelli Editore, Roma.

Marelli E. (2004a), "Evolution of Employment Structures and Regional Specialisation in the EU", *Economic Systems*, 28, 35-59

Marelli E. (2005), 'Regional Employment Dynamics in the EU: Structural Outlook, Co-movements, Clusters and Common Shocks', in Caroleo F.E., Destefanis (Eds): *Regions, Europe and the Labour Market: Recent Problems and Developments*, Heidelberg, Physica-Verlag

Nickell S. (1997), "Unemployment and Labor Market Rigidities: Europe versus North America", *Journal of Economic Perspectives*, vol. 11, n. 3, 1997, 55-74.

Nickell S., Layard R., (1999), "Labour Market Institutions and Economic Performance", in Ashenfelter, Card (1999). Ashenfelter O., Card D. (a cura di), *Handbook of Labor Economics*, North Holland.

Niebuhr A., (2002), *Spatial dependence of regional unemployment in the European Union. HWWA* Discussion Paper 186.

Oecd, (1999), Employment Outlook, Paris, .

Paci R, Pigliaru F, Pugno M., (2002), *Le disparità nella crescita economica e nella disoccupazione tra le regioni europee: una prospettiva settoriale*. In: Farina F, Tamborini R (eds), *Da nazioni a regioni: mutamenti istituzionali e strutturali dopo l'Unione Monetaria Europea*, Il Mulino, Bologna.

Pench LR, Sestito P, Frontini E., (1999), "Some unpleasant arithmetics of regional unemployment in the EU, are there any lessons for EMU?". European Union DG XII, Brussel.

Paci R, and Pigliaru F., (1999), *European regional growth: do sectors matter?* In: Adams J, Pigliaru F. (eds), *Economic growth and change, national and regional patterns of convergence and divergence*, Edward Elgar, Celthenam.

Soltwedel R., Dohse D., Krieger-Boden C. (1999), "EMU Challanges European Labor Markets", IMF Working Paper n. 99/131, Washinghton D.C., 1999.

Taylor J, Bradley S., (1997), "Unemployment in Europe: a comparative analysis of regional disparities in Germany, Italy and the UK". *Kyklos*, 50(2):221–245.