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Regional differences in the European labour market
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The European economy is characterised by widely regional disparities. We shall analyse the regional disparities in unemployment, employment and the participation rate, applying a dynamic multivariate analysis methodology named STATIS. The evolution of the regional structure of the European labour market hold in the 90's has shown by using a set of 10 economic indicators. The results evidence the existing disparities and their dynamic in the period considered

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Introduction

The scientific interest for the European regional differences has increased in the last decade. In fact the disparities among the European regions are greater than those existing among the European Nations and they are one of the most problem that the Ue has to deal with. The most important stylised facts shows that: (i) there are strong disparities in economic performance between different parts of Europe (*6th periodic reports*); (ii) the regional disparities problem has grown starting from the '70s with the admission of UK Ireland, Greece, Portugal, Spain in the EU community; (iii) the problem may further grow with the enlargement of the EU.

There are at least three different approaches that try to find a theoretical explanation to the dimension of the European disparities. Besides many studies direct to measure the regional disparities (Amendola, Caroleo, Coppola, 1997; Dunford, 1993, 2001; Storti, 1995, Overmann Puga, 1999; Piacentini e Sulis, 1999), the literature on

Growth is interesting to test the convergence of GDP per capita among the regions (Sala-i-Martin, 1995). A second approach tries to measure the shock effects on the adjustment mechanisms in the labour market (Blanchard and Katz, 1992; Decréssin and Fatas, 1995). The usual hypothesis is that the speed of labour market re-equilibrium is directly proportional to its level of flexibility, measured in terms of labour mobility and wages. The third approach may be represented by the New Economic Geography (NEG). The regional growth paths depend on the localisation of economic activities. A high factor mobility with low transportation costs may determine phenomena of agglomerations causing divergence paths (Krugman and Venables, 1999).

In this preliminary version of the paper we shall propose a method, by using variables of the labour market, in order to measure such differences and their evolution in time. The paper is so structured. In the second paragraph it is described the state of the art of the literature and the empirical evidences on regional disparities in Europe, in the third the STAGIS method is explained, while in the fourth, the main significant results obtained are reported. The last paragraph contains some short conclusions.

2. The state of the art

The European economy is characterised by marked regional differences. These disparities have been clearly stabilised from the mid of 80s after two periods in which, until the mid of 70s, a slow rate of convergence between countries and regions has prevailed, and after that, with the admission of UK, Ireland, Greece, Portugal, Spain in the EU community, this process comes to halt and divergence increases within some country (France, Italy, Spain).

The interest in studying the European regional differences lies both in theory and policy reasons. Three are the theoretical fields explaining regional differences and the tendency to convergence or divergence of the economies: the neoclassical theory, the endogenous growth and the new geography. The first one, both in the strong version or in the weak version, tends to deny the long period persistence of divergences. In fact, the highly stylised one-sector neoclassical growth model with exogenous technological change predicts unconditional convergence. The basic “capital-labour-total factor productivity set-up” is augmented to take into account the impact of human capital, natural resources, public goods and political stability. In presence of reproducible

capital, poor regions with low capital/labour ratios have a higher marginal productivity of capital, and therefore, will grow faster than richer ones, given the same level of saving and investment. The necessary conditions are a free factor of mobility and free trade. The technical progress is a “public good”: all economies will benefit. In his weak version hypothesis, the idea is that, while the adoption of technological innovations is the determinant key of economic growth, the adoption process itself can be easily disrupted or retarded by the wrong set of socio-political conditions. The empirical studies generally try to test the convergence hypothesis analysing the trend of GDP per capita among the regions (Sala-i-Martin, 1995). A similar approach, interesting from our point of view, try to measure the shock effects on the adjustment mechanisms in the labour market (Blanchard and Katz, 1992; Decréssin and Fatas, 1995). The conventional hypothesis is that the speed of labour market re-equilibrium is directly proportional to its level of flexibility, measured in terms of labour mobility and wages.

The neoclassical model has been challenged by the new theory of endogenous growth that argues the main forces of convergence-divergence may come from the externality effects of R&D expenditure (Romer) and human capital formation (Lucas). In this case it is easier to find convergence “clubs” according to the capacity of poor regions to absorb technical progress emanating from the advanced regions and improve their human capital efficiency and innovation capacity. The empirical studies test the hypothesis of a conditional convergence instead of an absolute convergence as in the neoclassical theory.

In the New Geography theory (Krugman) a “core”-“periphery” structure may emerge along with trade integration. The reduction of transactions costs could lead to the spatial concentration of increasing returns to scale industries in the core, where the periphery would specialize in constant returns to scale industries. The understood reason is that investment and innovation, at the origin of growth, require an array of inputs which, because of the various transaction costs, is less costly when production is geographically concentrated.

The last two approaches, and especially New Geography have some roots in the uneven development literature of Myrdal and Kaldor, in the concept of cumulative causation, and imply a sort of polarisation models: twin peaks model, convergence clubs, clusters.

Nonetheless the theoretical developments on regional differentials doesn't fit the evidence of the "European case" in the last 30-40 years. In fact, as said before, the European experience shows periods in which countries convergence sometimes appears with a widening sometimes with a narrowing of regional disparities. On the other hand, the theories on "divergence-convergence trade off" are, from a rigorous analytical point of view, strictly related to strong opposite conclusions: absolute convergence for the neoclassical model, non-stop of divergence for the endogenous growth theory and the new geography approach.

From the policy point of view, the question is: are the policy strategies carried out in Europe able to foster the convergence process in EU regions? Generally speaking the Maastricht Treaty states that for high rates of growth to be sustained in lagging regions structural policies must be allied with policies ensuring financial stability. Furthermore, the nominal convergence and the euro determine a more integrated economy with expansion of trade and growth of direct investment between countries and these frameworks can do more than offset the removal of exchange rate policy. In other words, the real convergence is actually a consequence of the nominal convergence.

But we have to remind that a severe stance damages the indigenous investments, and consequently productivity, growth and competitiveness, that are, precisely, the target of European structural policies. Hence the subsequent question is: there is consistency of stabilisation policy with structural policies, i.e. regional policy (Boldrin, Canova).

To answer to the theoretical and policy questions we should summarize the factors, often complementary, sometimes concurrent, that are considered as potentially able to create, maintain or intensify a divergence process between regions. a) The composition of aggregate demand. All theory and policy approaches including medium and long run evaluations cannot consider the composition of aggregate demand equivalent. Specifically, it is well known that investments and exports have substantial effects on medium term. b) Factors endowment and fundamentals. Generally the endowments have been referring to human capital, skill labour (see for example the emphasis on human capital by endogenous growth theory) and, more recently, to a peculiar concept of "endowment": the "social capabilities", a label coined by Abramovitz in the middle 90s, i.e the ability of a country to imitate products realised

abroad, the ability to adapt imported technologies to national or regional context, the capability of importing suitable organisational and institutional form from abroad. It points the possibility of a region to endow with an “organised market structure”. c) The nature and behaviour of financial and credit institutions. The relation “bank-industry” has been widely analysed by development theorists that have stressed, as Alexander Gerschenkron, how the timing of industrialisation, the “late comers countries” and the provision of finance to industry were influenced by banking structures, universal banks or specialised banks. d) Nature of regional production function, i.e. presence of scale economies and increasing returns. f) labour market framework, i.e. wages, mobility constraints, skills and factors that, usually, are considered as squeezing a divergence tendency but hard to be explained as an efficient cause.

If we analyse an “open economy” with “state intervention” other factors are stressed by literature: g) an export-led process and h) the nature of policy maker reaction function in presence of external shocks, symmetric-asymmetric-idiosyncratic, reaction usually labelled as “wet” or “hard nosed”.

Since the whole analysis of these factors is obviously beyond our aim, we will simply try to study the dimension of the European disparities using a method that will allow us to measure dynamically the regional disparities (Amendola, Caroleo, Coppola, 1997; Dunford, 1993, 2001; Storti, 1995, Overmann Puga, 1999; Piacentini e Sulis, 1999) particularly referred to labour market. However, the results are far reaching and allow us to answer to a lot of theoretical and policy problems as said before.

3 . A multidimensional approach measuring regional disparities: The STATIS methodology

As we have pointed out before, the regional disparities in Europe have been measuring, using different methods. It depends on four kinds of choice. First the method used. Applying different methods, one can obtain different results. The second choice concerns the variable used to measure disparities. The more used are still GDP per capita and the unemployment rate. Nevertheless, there are also other variables that can help to better understand the differences existing among the European regions. One of them is the long run unemployment, because once deep – seated, it takes a long time to

reduce itself (Layard, Nickell, Jackman, 1994).

The level of territorial desegregation is the third kind of choice that influences the final results and for the Europe, that is a group of regions designed by different National systems, it is a crucial point. In other word choosing the NUTS 2 level, instead of NUTS 1, it may carry out to different results concerning regional disparities. The fourth problem is the period considered. It is well-know that with the European enlargement continuos process, the number of regions changes over time. For this reason, choosing different period, the final results may change.

Concerning the first choice, as to say the method used, we adopt the STATIS method. STATIS helps to analyse multiway phenomena which can be represented by tridimensional matrices: variable-space-time (Escoufier et al, 1985; D'Ambra, 1986; Amendola, Caroleo, Coppola, 1997, Appendix n°3; Bodo, D'Alessio, Signorini, 1992; Fachin, Vichi 1993; Tassinari, Vichi, 1994; Baffigi, 1996). In fact. in out case we have several variables (characteristic indicators) relating to statistic units (European Regions) observed over the years and STATIS can synthesise, by n latent variables, the main elements which characterise the territorial structure and individualise their time evolution.

The method consists of analysing a tridimensional matrix $({}_tX_{ij})$, where t are time observations, i statistic units, and j variables ($i=1,2...I; j=1,2...J; t=1,2...T$), through three phases: interstructure, compromise and infrastructure. The interstructure phase output describes, in a bidimensional space, the structure of T matrixes in order to test their similarity. The compromise phase consists of estimating, by an optimising rule, a "synthesis matrix" that represents in synthetic form the information contained in the T matrixes. In this phase both the j variables and the i statistic units are drawn in the bidimensional space identified by the first two principal components. The 11third phase, the infrastructure, represents all units and all variables in the factorial space of compromise, identifying the trajectories of each variable and of each unit through the years.

The advantage of using STATIS method is to treat jointly different characteristic indicators of the regions, in order to have a synthesis of the regional disparities. Being a sort of non parametric approach, it has also the peculiarity of not be conditioned by a model a-priori chosen. An other advantage is that it is possible to describe both the

structure of the regional disparities than their dynamic over time, and the contribute given by each variable. Applying this method we can also identify clusters of regions according to the labour market, income and production structure indicators.

The variables considered in the analysis are 10 characteristic indicators concerning the labour market and of the productive structure. The first variable is the population density (DEN), considered proxy of the level of agglomeration. Particularly the labour demand is measured by the employment rate (TOT), while the labour supply is measured by the participation rate (TAT). The percentage of long run unemployed (ULR) is considered as an index of efficiency of the labour market. The index of the relative female participation (TAF), obtained by the ratio of female participation rate and male participation rate is considered as proxy of the inclusion of the women in the labour market. The percentage of part-time employed (HT) is used as an index of level of flexibility existing in the labour market, and the percentages of the 3branches employed – Agriculture (AGR), manufacturing (IND) and service (SER) - represent the economy structure. Finally we consider the Purchasing Power Parities per capita (PPS) as proxy of the income level.

	Indicators used in STATIS analysis	code
1	population density	den
2	activity rate	tat
3	female activity rate / male activity rate	afm
4	employment rate	tot
5	quota long run unemployment	ulr
6	quota part time employed	ht
7	percentage employed in agriculture (B01)	ag
8	percentage employed in industry (B02)	in
9	percentage employed in services (B03)	ser
10	Purchasing Parity Power	PPS

The cases are 130 European Regions. They have been chosen, taking into account the administrative national division and data available from the EUROSTAT REGIO in order the cover of the whole EU-15's territory. They correspond to NUTS 2 level for Greece, Spain, France, Italy, Austria and Portugal, NUTS 1 for Belgium, Germany, Netherlands, Finland, and United Kingdom, NUTS 0 for Denmark, Ireland, Luxembourg and Sweden (Appendix 1- 2).

The time period is 1991- 2000. In this period the number of the regions is almost

stable. In fact the German regions remain the same number (there isn't the break due to the re-unification) and only 3 country,- Austria, Finland and Sweden – have become members of European Union.

The Data Bank used is Eurostat Newcronos Regio.

4. The Results

One of the results obtained is a geo-economic maps of the European regions build with the latent variable given applying the STATIS method. The first three principal components, extracted from the variables set, explain the 73,48% of the total variability (table 2)

Table 2 3 PREMIERES VALEURS PROPRES

AXE NUMERO	VALEUR PROPRE	POURCENTAGE D'INERTIE	POURCENTAGE CUMULE
1	4,19967	40,91	40,91
2	2,14453	20,89	61,79
3	1,19976	11,69	73,48

So we have relative little loss of variability when the phenomena is represented in the three-dimensional space identified by the three first factors. The first factor, that captures the most part of the total variability (40,91%), is positively correlated with the GDP pro capita, the activity rate (TAT), the employment rate (TOT), with the relative female participation index (AFM).and part time employed (PT). It is also negatively correlated with the percentage of long run unemployed (ULR) and the quota of the employed in the agriculture sector.

This factor may be read as a performance index of the labour market performance of the European regions. In fact the position of the variables in the factorial spacemarks a clear representation of the European labour market structure. Along the first axis there are, on the one hand, the employment rate and the activity rate, and the variable approximating labour participation as the relative participation female ratio, against the quota of long run unemployment rate.

Figure 1

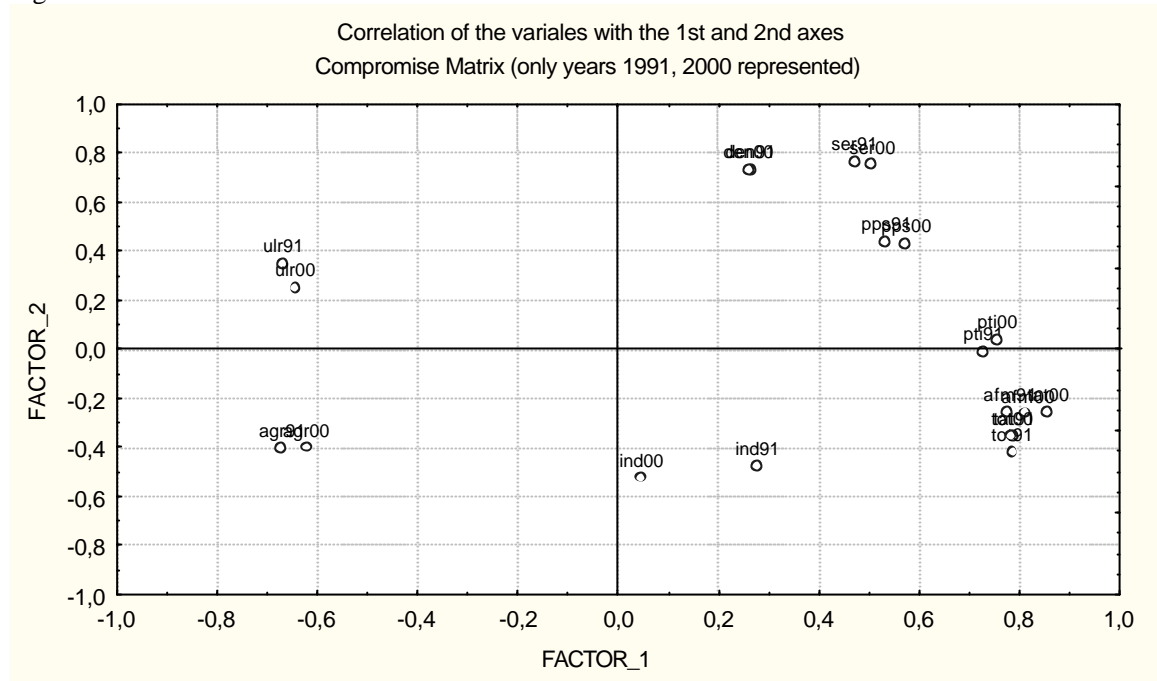
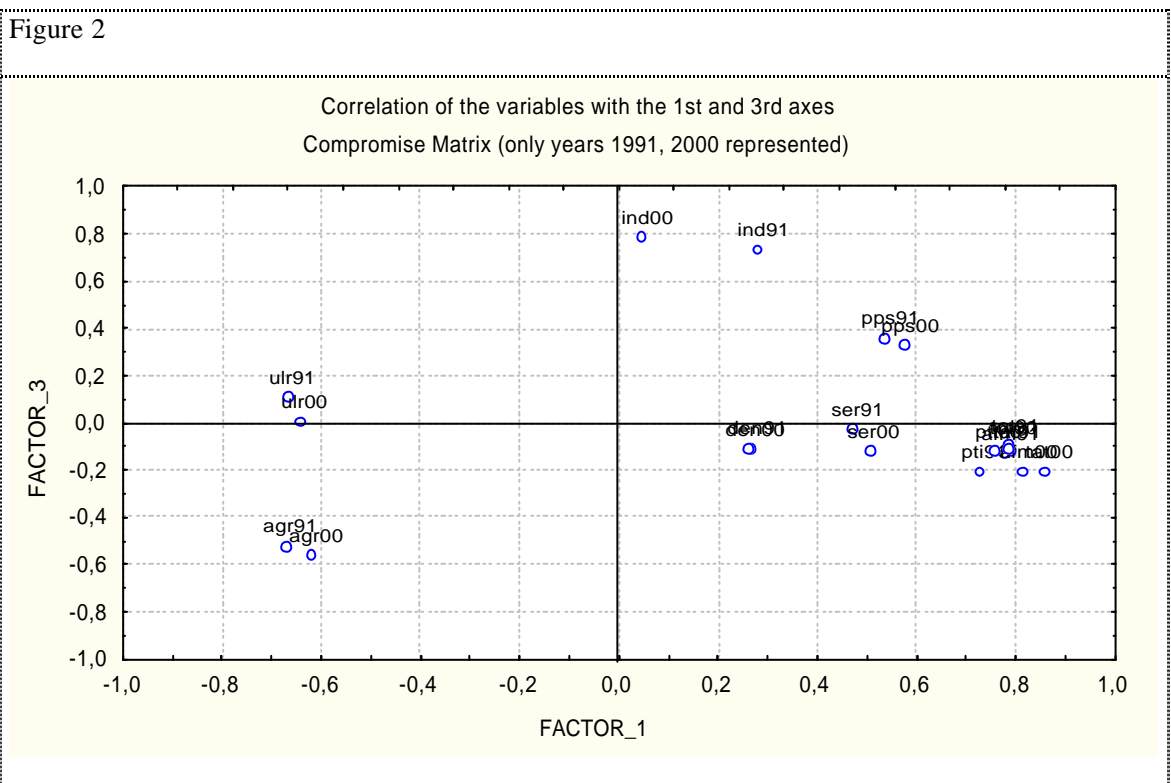


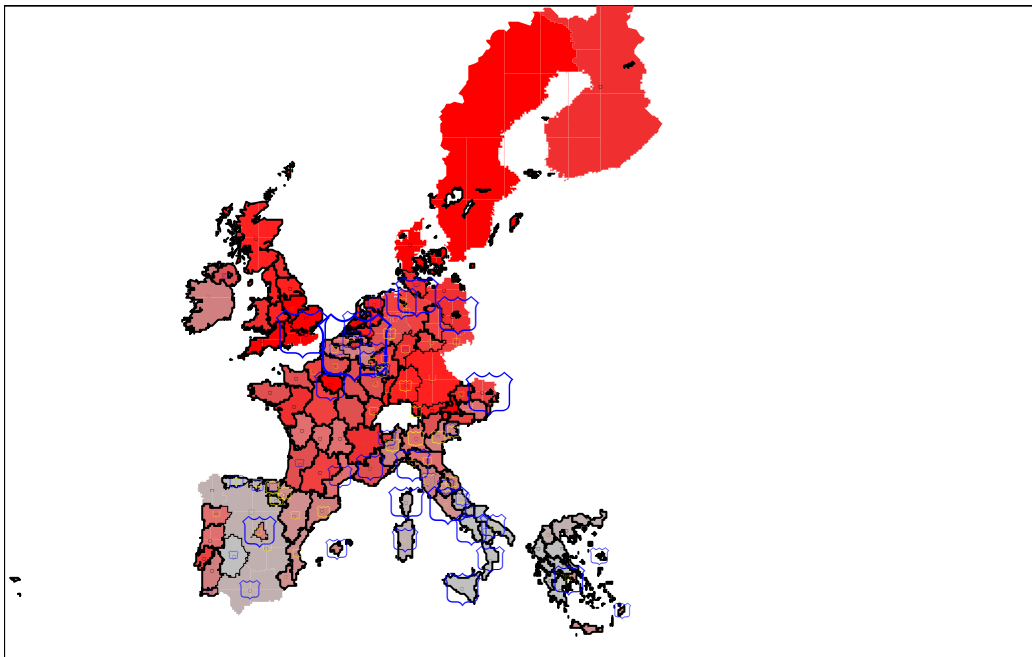
Figure 2



Among other things, this result may be interpreted as the well-known “discouraged worker effect” still acts since high levels of participation rate are related to high employment rates. This implies that employment shocks, at regional level, may be permanently balanced by a higher participation in the labor market (Eichengreen, 1992; Amendola, Scattaglia, 1992; Decressin, Fatàs, 1995). Perhaps it may be considered also an index of flexibility of the labour market, being positively correlated also with the quota of the part-time employed.

In the figure 3 the more coloured regions are positive correlated with the high value of the first factor. The distribution of the regions, shows mainly the clear difference between the continental Europe and the Mediterranean one. In fact the most part of the regions, belonging to the South European Countries, Greece, Spain and Italy, show a low value of the first factor. For Italy is clear the cut between the Mezzogiorno and the rest of the country, while for Spain the model more adaptable seems to be the core vs. periphery (Madrid and Catalonia vs. the other regions)

Figure 2



The first factor is represented by the red colour, the second by the blue dot, and the third by the yellow points

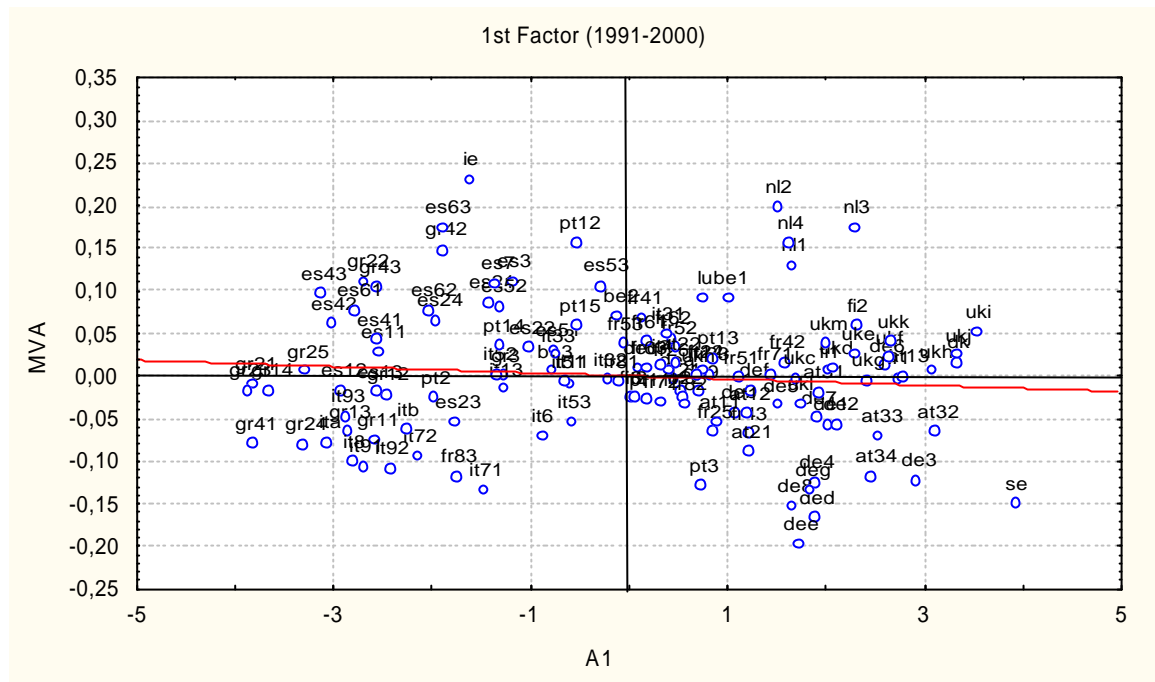
The second factor, that explains the 20,89% of the total variance, clearly identifies those regions with an higher percentage of employed in the service sector. In this cluster are included the capitals, firstly Bruxelles, London, Paris but also the many regions specialised in the tourism industry as Sardinia, Corse, Andalusia, and Canarias. This result, as to say, the dichotomy service sector vs. manufacturing and agriculture, has been also evidenced by other authors (Paci, Pigliaru, Pugno, 2002).

It is more difficult to give a clear interpretation of the third factor too. It distinguishes the industrialised regions from those ones with an important presence of agriculture. In the manufacturing cluster we find many regions of the Germany and of the Northern Italy.

The second step is to study the dynamic. In the Figure 1, the values of the first and last years are reported. It is clear that some variables are more stable than others. In fact weight the density (DEN) is remained almost the same, while the quota of employed in the manufacturing sector changes over the year.

In the Figure 4 the dynamic of the first factor, that we have considered a proxy of the labour market is represented. The first axe shows the level of the first factor for the 1991 while the average change has been shown by the second axe. The result obtained is an high variability and a very slow convergence. It is clear evidenced, among the less developed regions, some of them has an high performance, like Ireland, while some others like Calabria shows a low performance. On the other side, there are some more developed regions, as the Netherlands' regions that have had a better performance.

Figure 4. The dynamics of the first factor



4. Conclusions

To measure regional disparities is import of the political coesion of the UE. There are several way to measure it. The results may be ambiguous. The focus of the paper was to give a better interpretation of the evolution of territorial differences in labour market and growth in Ue-15.

We adopted for the 90s the STATIS method, applied on a set of ten indicators to depict the structure of the European disparities and of their dynamics.

The results are the clear difference of the Mediterranean Europe, the role of the third sector and a very slow convergence among regions in the labour market performance in the considered period.

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Appendix 12

	NUTS 1	NUTS 2	NUTS 3
Belgique/België	Regions	Provinces	Arrondissements
Danmark	-	-	Amter
Deutschland	Länder	Regierungsbezirke	Kreise
Ellada	NUTS 2 groupings	Development regions	Nomoi
España	NUTS 2 groupings	Comunidades autonomas	Provincias
France	ZEAT + DOM	Régions + DOM	Départements + DOM
Ireland	-	-	Planning region
Italia	NUTS 2 groupings	Regioni	Provincia
Luxembourg	-	-	-
Nederland	Landsdelen	Provincies	COROP-Regio's
Osterreich	Gruppen von Bundesländern	Bundesländer	Gruppen von Politischen Be.
Portugal	NUTS 2 groupings	Comissões de coordenação regional+Regiões autónomas	Grouping of concelhos
Suomi/Finland	Manner-Suomi/Ahvenanmaa	Suuralueet	Maakunnat
Sverige	-	Riksområden	Län
United Kingdom	Standard regions	NUTS 3 groupings	Counties,local authority regions

Appendix 2 List of the regions

be1	Région Bruxelles-capitale/Brussels hoofdstad gewest
be2	Vlaams Gewest
be3	Région Wallonne
dk	Denmark
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
gr11	Anatoliki Makedonia, Thraki
gr12	Kentriki Makedonia
gr13	Dytiki Makedonia
gr14	Thessalia
gr21	Ipeiros
gr22	Ionia Nisia
gr23	Dytiki Ellada
gr24	Stereia Ellada
gr25	Peloponnisos
gr3	Attiki
gr41	Voreio Aigaio
gr42	Notio Aigaio
gr43	Kriti
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)
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
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
nl1	Noord-Nederland

nl2	Oost-Nederland
nl3	West-Nederland
nl4	Zuid-Nederland
at11	Burgenland
at12	Niederösterreich
at13	Wien
at21	Kärnten
at22	Steiermark
at31	Oberösterreich
at32	Salzburg
at33	Tirol
at34	Vorarlberg
pt11	Norte
pt12	Centro (P)
pt13	Lisboa e Vale do Tejo
pt14	Alentejo
pt15	Algarve
pt2	Açores (PT)
pt3	Madeira (PT)
fi1	Manner-Suomi
fi2	Åland
se	Sweden
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