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EUROPEAN REGIONAL CONCENTRATION OF ECONOMIC ACTIVITIES AND MODELS OF CAPITALISM

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SOMMARIO

In this paper we argue that the European definition of structural goals, not differently from the suggestions in the Sapir report, has been designed starting from an unstructured market economy viewpoint where institutional diversities play a marginal role. The strong emphasis on flexibility has produced subalternity of institutional assets in the policies definition increasing the risk of reinforcing the two (or three) speeds of Europe. We would like to study agglomeration effects together with institutions introducing the notion of Variety of capitalism into regional economics and analysing how relevant this aspect may be to define European Regional Policies. Given that it is difficult to find a general synthetic measure, we suggest to analyse one by one the different economic dimensions and to look for latent dimensions of explanation.

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INTRODUCTION

Human capital and knowledge spillovers are the crucial factors triggering a long wave of productivity and welfare in Europe. This is the economic refrain of scholars to the European commission (Sapir, 2003) as well as being the main idea behind the *Lisbon strategy*. Human capital is a basic ingredient for growth because it contributes to a better allocation of cognitive abilities of individuals in problem-setting and problem-solving decisions. Knowledge spillovers generate a virtuous cumulative causation mechanism through interaction of firms and diffusion of innovations. By following this growth path, Europe will modify its international profile, becoming a knowledge society able to compete with other macroeconomic areas like the USA and Asia.[3] It is less clear how this can be achieved and how such a development strategy can be tailored to the existing structural dimension of the differentiated European economies. This view, in fact, on the one hand takes into account agglomeration effects in economic development but, on the other, neglects the role of institutions in the same process.[4] In this paper we argue that the European definition of structural goals, not unlike the suggestions in the Sapir (2003) report, has been designed starting from an unstructured market economy viewpoint where institutional diversities play a marginal role. The strong emphasis on competition and flexibility has transformed institutions into a subordinated element in the definition of policies, increasing the risk of reinforcing the two (or three) speeds of Europe. In this paper we aim to study agglomeration effects together with institutions introducing the notion of Variety of capitalism into regional economics. This will help us to analyse how relevant this aspect is to define the spatial concentration of economic activity and, consequently, to define European Regional Policies. As a consequence, we simply put forward a basic hypothesis according to the empirical study of Amable (2003): EU15 contains at least four main models of capitalism which display some different ways of functioning. Our aim is to show that these four capitalisms also display different geographical patterns of development, i.e. some specific forms of interaction between the spatial agglomeration effects and the coordinating and redistributing effect of institutions. This viewpoint also has some consequences for the identification of advanced and lagging regions and on the eligibility criteria to European Structural Funds, but we will not be discussing these aspects.

The paper is organized as follows. The first two sections introduce the theoretical perspective of Variety of capitalism as a reference to introduce a territorial explanation different from the one based on the resource allocation theory. The third section illustrates data and the research methodology of the empirical exercise. Section four discusses the relevance of models of

[3] However, such a sociological process is grounded on the harmonization of different European institutional cultures and it assumes that competitiveness can be evaluated on the basis of common and fungible factors. In our opinion, features and differences exist in local development patterns that make it difficult to compare regional economies.

[4] This obviously depends on what we mean by the term institutions. Here we do not only refer to the various levels of the Public Administration, we include all the macroscopic self-enforcing regularities of behaviour of economic actors.

capitalism from the regional perspective and the sixth section discusses the main results. The sixth section describes the differences in agglomeration patterns for models of capitalism. Conclusions follow.

1. DIFFERENT MODELS OF CAPITALISM

We introduce institutions into the study of the concentration of economic activities through the concept of *model of capitalism* (MC).[5] Theories of variety of capitalism state that we cannot conceive the economy as an unstructured market. Economic co-ordination is not achieved through the price system alone; prices are formed in a variety of ways and institutions define the organisational principles defining economic systems. Specific institutional arrangements exist that shape the co-ordination mechanism. They are differently shaped in countries and regions due to the diversity of institutional arrangements, i.e. institutions and the way they are interlinked. Institutional complementarities and hierarchies *give form* to evolutionary patterns of territorial economies and define their economic identity and competitive potential. Starting from such complementarities, it is possible to single out a limited number of ideal types of capitalism.

This view opposes the mainstream perspective where economies are conceived simply as "markets" and where the role of institutions is conceived as functional to the best performance of an abstract market. This scarce consideration of the role of institutions can easily be found in the basic logic of the European institutional reforms, given that policies are engaged to pinpoint the *best practices* in different countries. The consequence is that nations and regions are thought to obtain the best institutional configuration for resources allocation through partial modifications of institutional assets (i.e. institutional convergence).

Schonfield (1965) was among the first scholars to analyse institutional diversity during the modernization process of mixed economies with respect to state intervention. His contribution was fruitful for economic sociologists engaged in detecting differences in national labour markets especially with respect to the wage-labour nexus. Other authors have identified ideal types of capitalism focusing on the matching between organizational models and institutions in the solution of coordination problems at the firm level.[6] Albert (1991) introduces a

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[5] *Régulation* theory recognised that space plays a major role in the economic processes (Lipietz, 1977), but chose an explicit theoretical strategy to avoid any endogenous role of space besides that given by the "national" institutional forms in defining economic systems.[5] As a consequence, the *Régulation* studies have concentrated on macroeconomic growth regimes without inquiring into the forms of the spatial deployment of accumulation and the contribution of space to the coordination of economic processes. The evolution of the *Régulation* studies towards national innovation systems (SSIP, Amable et al., 1997) still did not question the spatial definition of growth regimes. The same can be noted for other studies such as Aoki (2001) Comparative Institutional Analysis or the Variety of capitalism (Hall and Soskice, 2000) which did not consider space.

[6] Cf. Dore, Lazonick and O'Sullivan (1999); Hall and Soskice (2001); Streek and Schmitter, (1985), Hollingsworth, Strek and Schmitter (1994), Aoki (1997).

distinction between Anglo-Saxon and Renanian capitalism, taking the USA and Germany as benchmarks. Amable (2003) is the most recent theoretical contribution to the analysis of variety of capitalism.[7] A fundamental outcome of his analysis is that existence and persistence of different institutional macro-configurations depends on multiple equilibria of institutional complementarities.[8] This means that, in order to achieve the best economic co-ordination reducing uncertainty, the fundamental requirement of institutional arrangements is *coherence*. Moreover, a plurality of these configurations may be equally efficient in the co-ordination of economic growth process. Therefore, competitiveness depends on the stability of institutional configurations, i.e. on the system's ability to reduce the uncertain horizon of economic agents.

Institutional configurations are not equivalent, however, nor are they modifiable without costs. Some of them fit particular technological specializations and their ability to produce growth varies during time because of technological evolution. They foster different investment directions, reducing the set of growth opportunities. This means that a strong linkage between the institutional configuration and the production specialization of countries exists. As an example, the German institutional model has favoured a growth strategy based on large firms specialized in chemical and electromechanical sectors. The Mediterranean countries have not followed this path but have nonetheless achieved successful growth strategy (Italy in the past, Spain at present). Again, the Asian institutions did much to help specialisation in consumption electronics and microelectronics.

The literature on variety of capitalism has not investigated the regional dimension and location patterns of economic activities engendered by national institutional configurations. Nonetheless, empirical studies assuming an institutionalist viewpoint have produced a rich literature in regional studies. Most of them are microeconomic studies investigating what regional factors produce positive externalities and increasing return effects, especially knowledge spillovers (Doring and Schnellenbach, 2006). Broadly speaking, they show that regions have different knowledge production functions because of institutional differences in terms of human relations (social organization), institutional actors and historical events (path-dependency) (Saxenian, 1994; Audretsch and Feldman, 2004; Pecquer and Zimmermann, 2004). In this paper we do not go into microeconomic differences and we do not analyse causation processes which are typical of each region. Instead, we *describe* the role of macro-institutional configurations in the spatial distribution of economic activities starting from the European models of capitalism (MC) as defined by Amable (2003). Therefore, we assume geographical distinction of MC as a region with a reasonably homogeneous macroscopic

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[7] In order to identify different models of capitalism, he uses indicators associated with five fundamental institutional areas for 21 Oecd countries: a) product-market competition, b) the wage-labour nexus and labour market institutions, c) the financial intermediation sector and corporate governance, d) social protection and Welfare State, e) the education sector. Using a principal component analysis, he represents the institutional design of different capitalisms and, by applying a cluster analysis, he collects countries with similar institutional characteristics.

[8] See Aoki (2001) for this concept.

institutional configuration and analyse to what extent such distinctions reveal differences in spatial concentration of economic activities.

We are aware that regional economic performance depends on other elements of a physical, cultural and local-institutional nature. This interaction between local and national institutions can also produce different contexts[9] but we restrict our investigation to the hypothesis that different MCs can drive different regional distribution of economic activities. We assume that the level of regional differentiation can depend on the patterns of growth it best fits or, simply, on fostering particular relationships between national and local institutions that encourage/discourage differentiation or agglomeration. Therefore, core-periphery relationships may be part and effect of the way institutions relate in a model of capitalism.

2. EUROPEAN COMPETITIVE REGION AND VARIETY OF CAPITALISM

The main goal of the EU agenda from a regional viewpoint is that of convergence of growth paths – in order to realize a better allocation of resources in the European space – and to foster/produce competitiveness. At present, the attention of scholars and technicians is focused on empirical identification of growth and competitiveness indicators to better discriminate European regions as regards economic performance. However, this effort for a better regional performance specification is based on assumptions of institutional homogeneity, perfect rationality and rapid adjustments of less performing production paths through optimal reallocation of resources independently from co-ordination mechanisms.

The Sapir report argued that European regional policy is not efficient and suggested some radical changes. Cohesion policies are said to have little effect when performed at that level and a change towards more redistributing policies was suggested. Member states are found to be more effective in the implementation of convergence policies. At present funds are too dispersed over a variety of objectives and are not sufficiently harmonised with other national policies. The more recent EPSON final report (2006), on the other hand, reaffirms the need for a cohesion policy to foster differentiated regional capabilities and to reduce the resources gap between regions. This report also affirms the importance of cohesion policies in order to implement the Lisbon/Gothenburg strategy (ICT, R&D, Innovation, Human Capital, Age, Technologies) and to become a competitive and sustainable economic space.

The variety of models of capitalism approach can contribute to this debate. Regional differences can be more appropriately understood if we consider the institutional context. If we take into account the role of differently structured institutional configurations in the geography of European development, what can we say about cohesion policies and what

9 See Solari (2003) on this particular aspect.

about the Lisbon strategy? From this starting point, the European integration process is much more complex than what is currently proposed. First of all, regional diversity depends on the co-ordinating mechanism that shapes national capitalism. This means that we have to study the way regions exploit specific regional competitive advantages based on institutional specificities instead of achieving a common resources endowment. As a consequence, within the different types of capitalism regional disparities exist with territorial concentration of economic activities and production specialization that define a core-periphery model of productivity. Moreover, such disparities may take different forms in different MCs.

As regional specific assets play a crucial role in our analysis, we suggest re-discussion of the content of the European convergence process under way. That is, whether convergence means the adoption and diffusion among the member states of a best institutional framework – inspired by Anglo-Saxon capitalism - or a process of regional economic evolution within the capitalism model to which regions belong. We state that by assuming a benchmark or the best practice principle, we incur the risk of homogenizing the economic space, losing regional competences and/or reinforcing the regional divide. Regions belonging to market capitalism better fit the economic performance for global competition as required nowadays; regions belonging to other capitalisms can suffer a development delay because of a different co-ordination equilibrium so that their economic performance is insufficient for global competition. This means that they require a long time before triggering a virtuous endogenous development cycle.

Two key questions stem from these general remarks: do the European MCs converge in the regional distribution of economic activity? Are there different core-periphery relationships between models? The first question is addressed in order to understand the European spatial economic distribution from the variety of capitalism point of view. Secondly, similar or different as they may be, we analyse whether these models present a convergence in their regional spatial pattern, that is, whether they have a common/different core-periphery pattern.

As far as knowledge production is concerned, we focus on high-tech poles in Europe, asking whether they have a different intensity and concentration in the different models. We will relate this to the differences in institutional architectures in order to rank regions more easily with respect to the European goal of the knowledge society. Our hypothesis is that the UE effort to reduce region disparities may fail if institutional features are not taken into account.

3. THE REGIONAL DATA AND TERRITORIAL DEFINITION

In order to describe the European regional geography with respect to the variety of capitalisms, we have used the REGIO dataset of Eurostat. It is common knowledge that the

data coverage of this dataset is unsatisfactory because of many missing data; however, no better regional data sources are available at European level (Combes and Overman, 2004).

The role of macro-institutional configurations in the spatial distribution of economic activities is studied starting from the European models of capitalism (MC) as defined by Amable (2003).[10] Starting from a regional perspective, a model of capitalism (MC) is here defined as a *set of regions sharing a reasonably homogeneous macroscopic institutional configuration.* We are interested in observing European differences in geographical patterns of economic development and thus we firstly investigate the descriptive power of MC by studying the regional variance of a set of macroeconomic variables.

Eurostat classifies regions at different territorial levels: three regional levels (NUTS1, NUTS2, NUTS3) and two local levels (NUTS4, NUTS5). The regional hierarchy represents the administrative organization, generally made up of two levels. The third level (for some countries like Italy and France, it corresponds to NUTS1, for others like Germany and the UK, it is NUTS2 and for Belgium, it is NUTS3) has only a statistical usefulness.[11] National administrative partitions are very different among countries and are difficult to compare. In our study, in order to improve the significance of the comparative analysis and to obtain a more homogeneous territorial set of regions, we took a mix of NUTS1 and NUTS2. We took the NUTS1 level for Belgium, Greece, Luxemburg, Holland, Austria, Portugal and the UK to aggregate small administrative regions at NUTS2. For the other European countries, we took the NUTS2 level, i.e. the administrative regions. As a consequence we find 75 regions in the Continental model, 12 in Great Britain, 45 in the Mediterranean model and 14 in the Scandinavian model.[12]

To describe the European spatial distribution of economic activity with respect to MC, we analysed variance using the following dataset for the period 1994-2004. Missing data were estimated by linear interpolation. (see table 1)

Table 1 **Missing data and percentage of estimations**

STATE	Re-gions	Popula-tion	Den-sity	gdp	gdp per capita	household income	Employment rate	fem. Employment rate	HRST per capita	HRST core per capita	r&d/ employment	r&d expen-diture
Austria	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0	100.0	78
Belgium	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	78
Denmark	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0
Finland	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.6	40	0.0	38

[10] Amable (2003) determined four models in Europe: the Continental (Germany, France, Austria, Belgium; the Netherlands and Ireland), the Market-based (Great Britain), the Social-democrat (Denmark, Finland and Sweden) and the Mediterranean (Italy, Spain, Portugal and Greece). Here, we will refer to Great Britain by its name and to the "Scandinavian model" instead of to the Social-democrat one.

[11] For more information, www.eurostat.it

[12] The average area is between 15 and 23 thousand square metres, with the exception of Scandinavia where it reaches 58.7 thousand. The average population size is between 1.4 thousand in the Scandinavian regions and 4.9 in Great Britain.

France	22	9.1	9.0	0.0	0.0	7.0	3.0	3.0	9.1	0	100.0	0
Germany	40	0.0	27.0	4.2	5.6	0.0	4.0	4.0	12.8	16	0.0	52
Great Britain	12	37.9	9.0	0.0	0.0	0.0	0.0	0.0	12.1	17	-	56
Greece	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	56
Ireland	2	18.2	9.0	0.0	0.0	11.0	0.0	0.0	18.2	36	0.0	78
Italy	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	6	0.0	22
Luxembourg	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	9	0.0	-
Netherlands	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.3	9	0.0	22
Portugal	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.4	58	0.0	22
Spain	17	0.0	82.0	0.0	0.0	3.0	2.0	2.0	0.0	0	0.0	0
Sweden	8	0.0	0.0	0.0	0.0	0.0	2.0	2.0	27.3	18	100.0	0
Total/average	146	4.7	0.0	1.1	1.5	2.0	2.0	2.0	14.0	11	0.0	-
Data have been exstimated by extrapolations												

4. THE IMPORTANCE OF MODELS OF CAPITALISM AT REGIONAL LEVEL

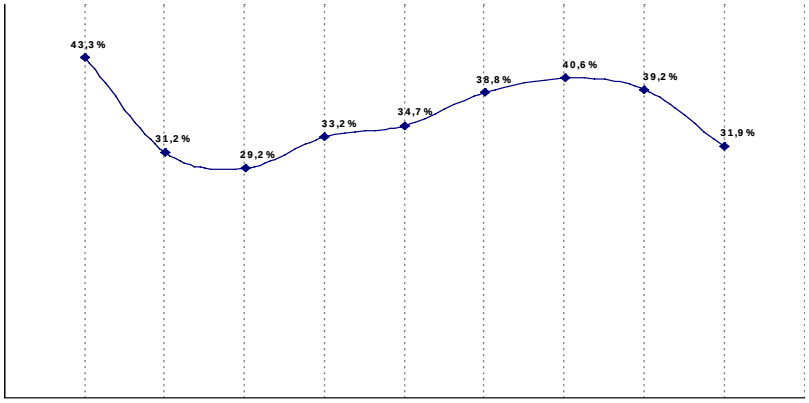
In order to detect the power of the MC in explaining regional differences in Europe we analysed the variance (η^2) of a set of economic indicators. We look for territorial concentration/dispersion of economic phenomena *within* each MC and for regional disparities *between* MC. In table 2 we report the η^2 measure for each of the variables we analysed. The following emerges:

- Differences in regional (average) demographic density are not, in the main, explained by MC. This means that the concentration of population is relatively neutral with respect to institutional settings and the pattern of historical settlements.
- GDP per capita is a measure which is significantly determined by regions belonging to different MCs. However, while 36.3% of variance of regional GDP per capita was explained by MC in 1995, it drops to 17.1% in 2003. This means that in the 8 years from 1995 to 2003, the regional distribution of average GDP per capita has become more homogeneous in Europe. Nonetheless it remains significant.
- Labour productivity *between* MCs – defined as Value added per employee – is less differentiated than GDP and it declined slightly from 17.0% in 1999 to 12.0% in 2003. Average regional productivity tends to be a more homogeneous variable and differences between MCs tend to disappear.
- Average regional household income per person, on the other hand, is one of the variables which are best defined according to MC. Also in this case the value of η^2 drops, from 43.3% to 31.9%, but it remains a significant source of differentiation. This is particularly interesting if we consider that this variable, relatively to GDP per capita, incorporates the redistributive effect of institutions (it includes the effect of taxes and transfers and other forms of redistribution). Consequently the different regional concentration of per capita GDP and household income tell us something about the spatial impact of welfare institutions.

Table 2 **Variance explained by Models of Capitalism, based on η^2 for each observed variable**

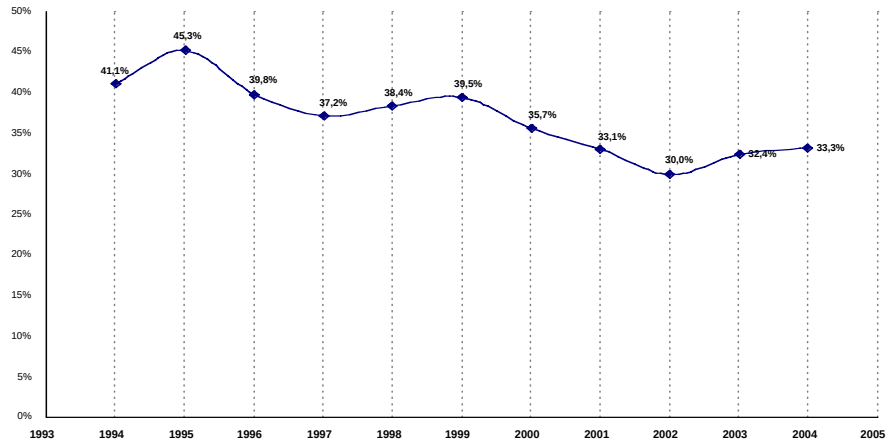
Regional Eurostat data	**1995**	**2000**	**2004**
Demographic density	4.7	4.6	4.4**
GDP per capita	36.3	23.6	17.1**
Labour productivity (GDP/L)	17.0*	17.0	12.0**
Household income per person	43.3	38.8	31.9**
Employment ratio	48.2*	45.5	36.2
Unemployment ratio (long-term)	27.1*	25.4	38.7
HRST (% of active population)	45.3	35.7	33.3
HRST Core (% of population)	62.7	55.9	46.6
Employment in R&D (%active pop.)	-	-	19.0**
R&D expenditure (% of GDP)	22.9	22.1	23.3**
Processing of Eurostat data – percentages; (*) 1999; (**) 2003.			

Figure 1 **η^2 pattern for disposable income of households**



- The employment and (long-term) unemployment ratio is another variable which has a different regional distribution according to MC. The former is quite high and, although it declines, it testifies that important differences exist for labour participation in Europe. The latter is lower but, disappointingly, rises in the course of time, so in 2004 MCs explain relatively well the regional distribution of unemployment.

Figure 2 **Percentage of variability in R&D personnel explained by models of capitalism, 1994-2003**



The last variables focus on the protagonists of the Lisbon strategy: R&D and Human resources in science and technology (HRST), both total and core definition.[13] These are the variables which are best defined in this variance test because a very high percentage of variance of such variables is explained by regions belonging to specific MCs. Also in this case the η^2 decreases, but in 2004, 33.3% and 46.6% of variance was still explained by MC. R&D expenditure, on the other hand, tends to increase its regional differentiation according to MC. As a consequence, the regional differences in high tech and R&D, which are central to the Lisbon strategy, tend to be closely associated with MC and this legitimises the analysis which follows.

5. THE CONCENTRATION OF POPULATION, EMPLOYMENT AND GDP

The first analysis of concentration concerns GDP, an indicator frequently used for economic performance (table 3). Four different measures have been used: the ratio of the first 5 and 10 regions to the total,[14] the Theil index and the adjusted geographic concentration index (AGC) proposed by OCDE.[15] The last index can be split into two components: territorial disparities in GDP and population concentration.

Indexes

In the following tables we use a set of different indicators. The ratio of the first 5 or 10 regions on the total is a rough indicator (due to the different number of regions between capitalisms) but, it nonetheless supplies good results. The Theil index is derived from

[13] The 'core' is defined by the employees working in science and technology sectors who are effectively qualified for such jobs (high degree).

[14] Although this measure is widely used, it is controversial because its calculation is sensitive to the number of regions. In our analysis, this concentration measure can be best used to compare Great Britain and the Scandinavian regions on the one hand, and the Continental and Mediterranean regions on the other.

[15] For a detailed analysis of concentration measures, see OCDE (2003).

Shannon's entropy and takes a normal distribution as reference. 'N' is the number of regions, 'y_i' the GDP of the i^{th} region.

$$T = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i}{\bar{y}}.\ln\frac{y_i}{\bar{y}}\right)$$

The AGC index (Adjusted Geographical Concentration) is due to OCDE (2003) researcher Spiezia and includes the differences in regions' size: 'a' is the area of a region, 'p' is population. It corrects some distortions of an index proposed by `Ellison and Glaeser (1997) (GC)` and normalises it as $AGC=GC/GC^{max}$.

$$GC = \sum_{i=1}^{N}\left|y_i - a_i\right|$$

It can be further decomposed into two sub-indexes.

$$AGC = \sum_{i=1}^{N}\frac{y_i - p_i}{y_i - a_i}\left|y_i - a_i\right| + \sum_{i=1}^{N}\frac{p_i - a_i}{y_i - a_i}\left|y_i - a_i\right|$$

The first term on the right-hand measures the effect of territorial disparity in GDP per capita and the second term the effect of geographic concentration of population (tab.2). The same is done in tab.3 with employment and population concentration.

OECD (2003) "Geographic concentration and territorial disparity in OECD countries" Territorial development policy committee, http://www.oecd.org/dataoecd/43/1/15179757.DOC

As we can see in Table 3, GDP is highly regionally concentrated in the Scandinavian and Mediterranean models. This result stems from both the Theil index and the AGC. The ratio of the first 5 and 10 regions gives us a different result but we can see that the number of regions affects results. The most explanatory index is the AGC: the concentration of GDP in space is always mainly due to the concentration of population (from 77% to 94%) and not to differences in GDP per capita. However, in Scandinavian countries concentration of GDP is mainly due to the concentration of population in a few regions while, in the Mediterranean regions, the component of disparities in GDP per capita is relatively high (more than 20% of the total index).

In both the Continental model and Great Britain, GDP is less spatially concentrated. However, per capita GDP carries greater weight in the concentration index composition for the Continental model compared to Britain where population density is more relevant. Regional disparities are higher in the other models, depending on scarcely populated regions in the Scandinavian model and on strong income inequality in the Mediterranean model.

The second measure (table 4) concerns employment, another measure related to regional competitiveness and production growth. In the Scandinavian model employment is more spatially concentrated than in other models. However, even in this case, the result is mainly determined by the concentration of active population and not by regional differences in employment opportunities. The opposite is true for the Mediterranean and, to a lesser extent, for the Continental models. In the Mediterranean model, regional disparities in economic growth play a significant role while for the other cases population concentration is crucial. We cannot say what the direction of the relationship is between population agglomeration and regional employment growth. However, broadly speaking, what emerges is that we must pay greater attention to population concentration tendencies in order to understand regional growth capability. The importance of regional differentiation of unemployment is in any case decreasing everywhere.

Table 3 **Concentration of GDP**

	Top 5			Top 10			Theil Index	Adjusted Geographic Concentration Index (AGC)		
	% area	% income	Concentration Ratio	% area	% income	Concentration Ratio	Values: [0=min inequal.l; 1=max inequal.l]	total	1st component Territorial differ. income per pers.	2nd component Geographical concentration of population
Continental										
1995	5.3	22.8	4.28	14.7	35.4	2.41	0.06	0.40	0.07	0.32
2000	5.3	23.8	4.46	14.7	36.8	2.51	0.07	0.38	0.06	0.32
2003	5.3	23.9	4.48	14.7	37.2	2.53	0.07	0.38	0.06	0.32
Great Britain										
1995	54.2	59.4	1.10	90.6	94.0	1.04	0.05	0.335	0.019	0.316
2000	54.2	60.6	1.12	90.6	94.3	1.04	0.06	0.344	0.034	0.309
2003	54.2	60.6	1.12	90.6	94.3	1.04	0.06	0.344	0.034	0.310
Mediterranean										
1995	16.5	34.3	2.08	33.6	57.5	1.71	0.11	0.423	0.091	0.332
2000	16.5	34.4	2.09	33.6	57.7	1.72	0.11	0.426	0.096	0.330
2003	16.5	34.3	2.08	33.6	59.3	1.69	0.11	0.420	0.087	0.333
Scandinavian										
1995	20.4	71.3	14.16	60.0	92.8	5.39	0.17	0.551	0.047	0.504
2000	20.4	72.3	14.35	60.0	93.5	5.44	0.16	0.564	0.052	0.512
2003	20.4	72.5	14.40	60.0	93.6	5.44	0.17	0.564	0.049	0.516

Table 4 **Geographical concentration of employment (total employed people, in thousands)**

	Summary statistics			Concentration Ratio		Adjusted Geographic Concentration Index (AGC)		
	Mean	St. Dev	Coeff. of variation	Top 5	Top 10	Total	1st component Territorial difference in employment rate	2nd component Geographical concentration of active population
Continental								
1999	1008.01	751.69	0.745	2.648	2.668	0.349	0.008	0.341
2004	1038.44	762.42	0.734	2.614	2.624	0.337	0.001	0.335
Great Britain								
1995	2227.65	938.99	0.421	2.059	1.033	0.322	0.001	0.321
2004	2334.96	961.50	0.411	2.043	1.032	0.319	0.000	0.320
Mediterranean								
1999	984.04	983.35	0.999	1.492	1.671	0.356	0.015	0.340
2004	1105.85	1084.34	0.980	1.519	1.668	0.350	0.009	0.341
Scandinavian								
1999	646.40	671.34	1.038	3.386	1.747	0.532	0.009	0.523
2004	670.91	685.23	1.021	3.396	1.746	0.536	0.005	0.531

(the number of employed people – proposed by OCDE – has been substituted by active population)

Table 5 **Descriptive statistics of GDP per inhabitant, 2003**

Model of capitalism	MIN	MAX	1st QUARTILE	2nd QUARTILE	3rd QUARTILE
Continental	17,045	57,075	21,624	23,800	27,327
Great Britain	12,173	42,476	23,150	24,365	25,812
Mediterranean	11,038	34,396	15,399	17,935	24,583
Scandinavian	15,065	41,178	22,339	24,844	27,800

6. DIFFERENT PATTERNS OF AGGLOMERATION IN MODELS OF CAPITALISM

The last tables (6a and 6b) show the results of a set of variability and inequality indicators on all variables of table 1. These are the coefficient of variation (cv), the variance of logarithm (varlog) and the Gini index.[16]

The data (varlog) show a similar concentration of population density in the Continental model and in Great Britain, even though the average density is different, respectively 389 and 641 inhabitants per km^2. The average density is low (175) in the Mediterranean regions where population is more uniformly distributed and very low (56) in the Scandinavian countries where regional concentration is fairly high.

In 2003, the average (of regional average values) labour productivity reached the highest levels in the Continental model (60.4 thousand euro) and in the Scandinavian regions (61.6). This value is slightly lower in the British regions (55.3) and in the Mediterranean model (49.6). However, the regional differentiation is quite high in the Continental model and in the Mediterranean regions while it is fairly low in the Scandinavian and British regions.

This resulted, in 2003, in very high GDP per capita values in the Continental and British regions, while they are considerably lower in the Mediterranean model and much higher in the Scandinavian one. The regional differentiation is very high in the Mediterranean model, it achieves a medium intensity in the Continental model, and is much lower in Great Britain and in the Scandinavian model. All statistical indexes of the British regions show a tendency towards a higher concentration in GDP per capita from 1995 to 2003.

[16] The coefficient of variation (variance/average) simply shows the variability, it can be compared between variables. Varlog is the variance of the logarithm (of the variable), it can be used as a good measure of inequality but it cannot be compared horizontally in tables. The Gini index has been criticized for this use, but it remains the only index which allows comparisons between different measures.

Table 6.a Regional inequality, all indexes

	Demographic density		Value added per employed person			GDP per capita			Household income per capita		
	cv	varlog	cv	varlog	gini	cv	varlog	gini	cv	varlog	gini
Continental											
1995	2,180	0,194				0,282	0,012	0,15	0,152	0,005	0,06
2000	2,182	0,194	0,281	0,010	0,13	0,280	0,011	0,14	0,118	0,003	0,07
2003	2,206	0,193	0,299	0,011	0,13	0,284	0,011	0,14	0,099	0,002	0,09
Great Britain											
1995	1,948	0,199				0,176	0,004	0,08	0,095	0,002	0,06
2000	1,965	0,200	0,187	0,004	0,07	0,212	0,006	0,10	0,131	0,003	0,07
2003	1,989	0,203	0,191	0,005	0,08	0,204	0,006	0,10	0,117	0,002	0,05
Mediterranean											
1995	1,034	0,142				0,315	0,018	0,18	0,287	0,015	0,15
2000	1,046	0,141	0,249	0,013	0,14	0,315	0,018	0,18	0,269	0,014	0,15
2003	1,047	0,142	0,231	0,011	0,13	0,286	0,015	0,16	0,257	0,012	0,16
Scandinavian											
1995	1,356	0,313				0,168	0,005	0,10	0,102	0,002	0,06
2000	1,375	0,328	0,124	0,003	0,07	0,202	0,007	0,11	0,122	0,003	0,07
2003	1,385	0,333	0,126	0,003	0,07	0,194	0,006	0,11	0,112	0,002	0,06

Table 6.b Regional inequality, all indexes

	Employment rate			Female employment rate			% employment in science & technology (core)			% employment in R&D			% expenditure in R&D		
	cv	varlog	gini	cv	varlog	gini	cv	varlog	gini	cv	varlog	gini	cv	varlog	gini
Continental															
1995							0.240	0.012	0.13				0.652	0.095	
2000	0.088	0.001	0.04	0.111	0.003	0.06	0.239	0.011	0.13				0.632	0.071	
2003	0.086	0.001	0.03	0.099	0.002	0.05	0.224	0.009	0.12	0.511	0.053	0.28	0.683	0.076	
Great Britain															
1995							0.091	0.002					0.572	0.050	
2000	0.059	0.001	0.03	0.061	0.001	0.03	0.177	0.005	0.10				0.567	0.049	
2003	0.046	0.000	0.03	0.050	0.000	0.03	0.167	0.005	0.10				0.574	0.063	
Mediterranean															
1995							0.354	0.020	0.19				0.603	0.075	
2000	0.142	0.004	0.08	0.235	0.012	0.18	0.360	0.021	0.19				0.452	0.038	
2003	0.134	0.004	0.08	0.216	0.011	0.12	0.359	0.021	0.20	0.451	0.042	0.25	0.487	0.050	
Scandinavian															
1995													0.650	0.333	
2000	0.105	0.002	0.06	0.128	0.003	0.08	0.305	0.015	0.17				0.600	0.244	
2003	0.112	0.002	0.07	0.135	0.003	0.08	0.270	0.011	0.14	0.511	0.105	0.30	0.623	0.195	

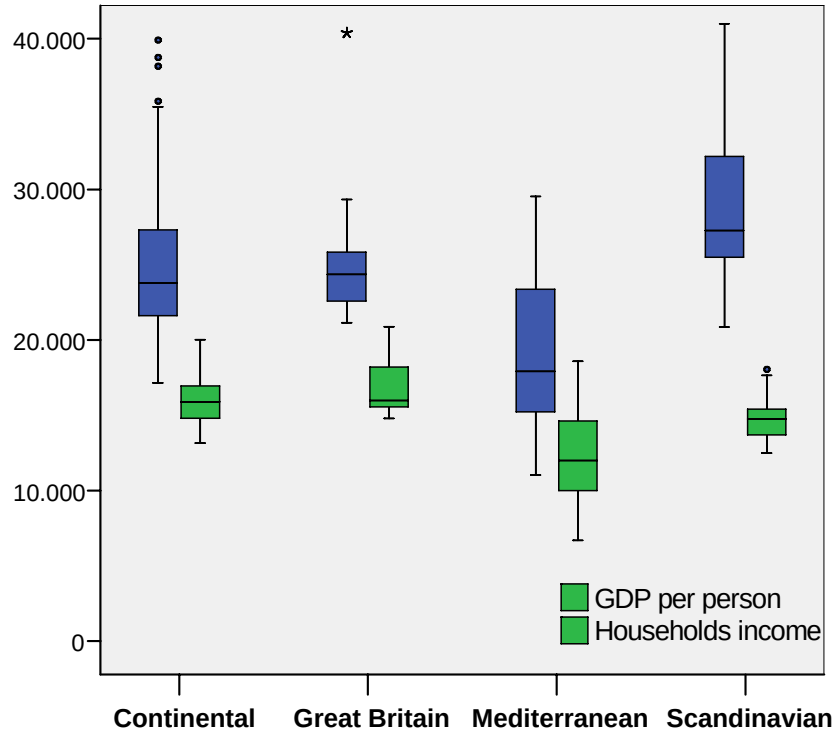


Figure 3 **The regional dispersion of GDP and Household income per capita**

The tendency is towards a rise in regional equality in the South. However, it is worth noting that in the Continental regions the very high differentiation in regional productivity persists at the level of GDP, while in the Mediterranean model a high differentiation in productivity is transformed into an even higher regional concentration of per capita GDP. A similar effect of increasing differentiation of per capita GDP compared to productivity exists in the British and Scandinavian regions.

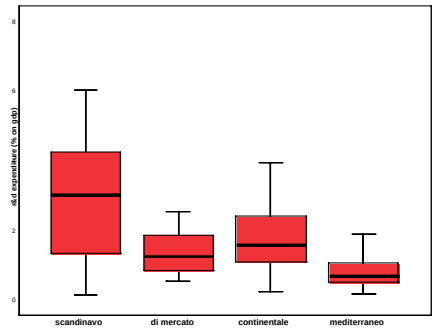
The comparison of differentiation between related variables is even more interesting when we consider household income since the impact of institutions is significant. As expected, institutions help to reduce inter-regional differences. The average household income is the highest in Britain (16.8 thousand euro in 2003) and much lower in the Scandinavian regions (14.8), in the Continental model (16.0) and in the South (12.4)(fig. 3). Variability remains very high in the Mediterranean model, although with a tendency to reduction, and practically the same in Great Britain. Variability is totally reduced in the Continental region and in Scandinavia, although at the expense of a higher reduction in average income. As a consequence we can say that macro-institutional configurations tend to equalize regional household income except in Great Britain and in the South. While in the former regional inequality is not high, in the latter it is an important phenomenon which is only marginally reduced. The tendency is not clear because varlog and Gini indexes provide different answers.

Employment rate is also a source of regional inequality. The higher average values are recorded in the Scandinavian (60.2) and British regions (58.2). It reaches 52.0 in the Continental region and falls to 47.2 in the South. These values are also the result of different ways of life. In the Mediterranean and in the Scandinavian regions we perceive significant regional differences in this variable (tab. 4b). The spatial concentration of female employment rate in the Mediterranean regions is quite high. Here the average value is low (35.3) which means that there are few regions with high female employment rates. Unexpectedly, there is also quite a difference in Scandinavian female employment between regions but the average ratio is the highest (56.8) and this means that there are few regions with low rates. These differences explain, in part, the differences we recorded between per capita GDP and labour productivity.

The core of our analysis concerns the data on R&D and employment in science and technology sectors (tab. 4b). We analysed the data of qualified (core) employment in science and technology sectors, employment in R&D and expenditure in R&D. In all these cases regional differentiation indexes tend to be high and this means that investments in this kind of knowledge are generally concentrated in a few regions.

Employment in HRST is highly regionally concentrated in both the Mediterranean and Scandinavian regions while the Continental model shows intermediate levels of concentration. However, while Continental and Scandinavian regions show a tendency towards equalisation, the Mediterranean regions display a worsening of inequalities. The average levels are similar for the British and Continental regions (7.7% and 7.0% respectively) while they are low in the South (5.1%) and very high in the North (11.7%).

Figure 4 **R&D expenditure by models of capitalism**

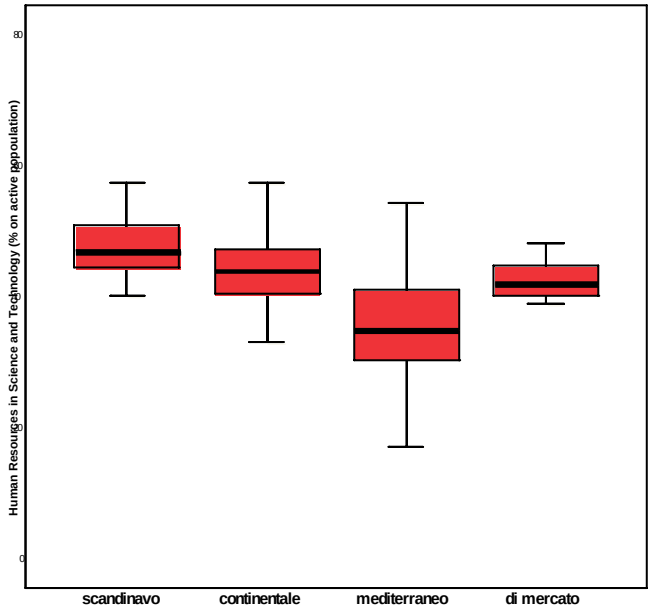


As expected, the percentage of expenditure in R&D reaches high levels in the Scandinavian regions (2.8%), a medium-high value for the Continental (1.9%) and British model (1.5%) and a low value for the South (0.8%). However, this expenditure is fairly concentrated everywhere, even though it achieves the highest levels in the Continental and Scandinavian

regions. It is interesting to note how this variable was highly concentrated in the Mediterranean region in 1995 while it became more generalised in 2004, but that homogenisation is due to a reduction of virtuous regions. Conversely, concentration decreases in the Scandinavian model. Employment in R&D tends to show similar concentration results with the highest scores in Scandinavian regions.

R&D personnel data confirm this result. For 2003, Eta squared is 33% which means that variability in the population ratio employed in the Science and Technology sector is explained by MCs and their different propensity to induce investment in knowledge production. This value decreases by 8 percentage points in the 1994-2003 period which means that in every MC we observe increasing investments in R&D (Figure 4 and 5). However the *within* variance is very large in the Mediterranean model (it contains some very high R&D intensity regions), while the Market and Scandinavian clusters show a more equal regional distribution of R&D personnel.

Figure 5 **Ratio of R&D personnel to total active population by MC**



7. CONCLUSION

In order to better understand the influence of institutional settings on economic geography, we apply the factor analysis to our variables associated with the four MCs. The total factor loadings of the two extracted factors is 73.8%, respectively 51.4% for the first factor and 22.4% for the second. Observing the rotated factor matrix, it emerges that the first factor represents the *distribution of income* per capita (both GDP and household income) in MC

while the second factorial dimension gives us a profile of the relationship of *employability* with respect to regional population density in MC.

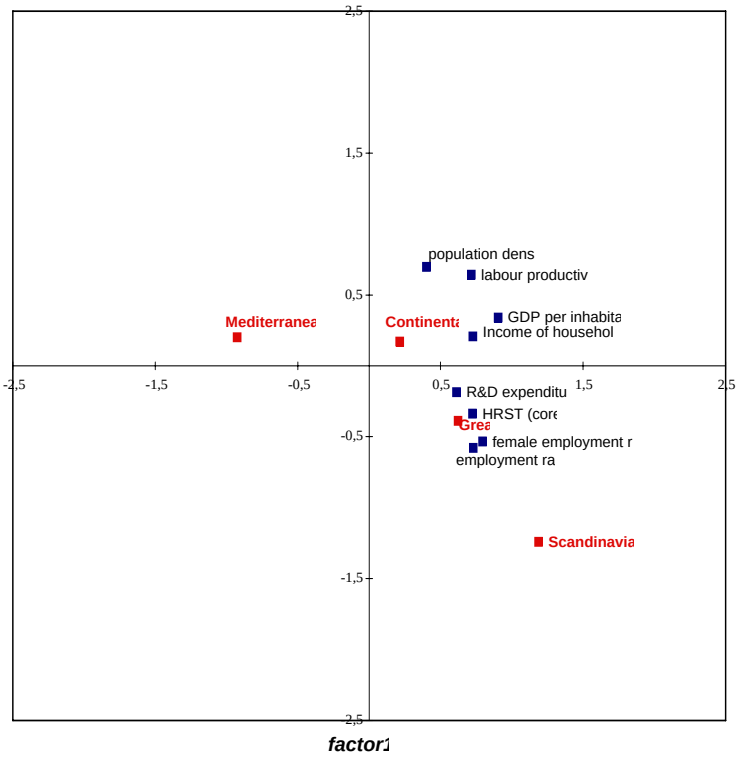


Figure 6 and 7 **Graphic representation of factor loadings for MC**

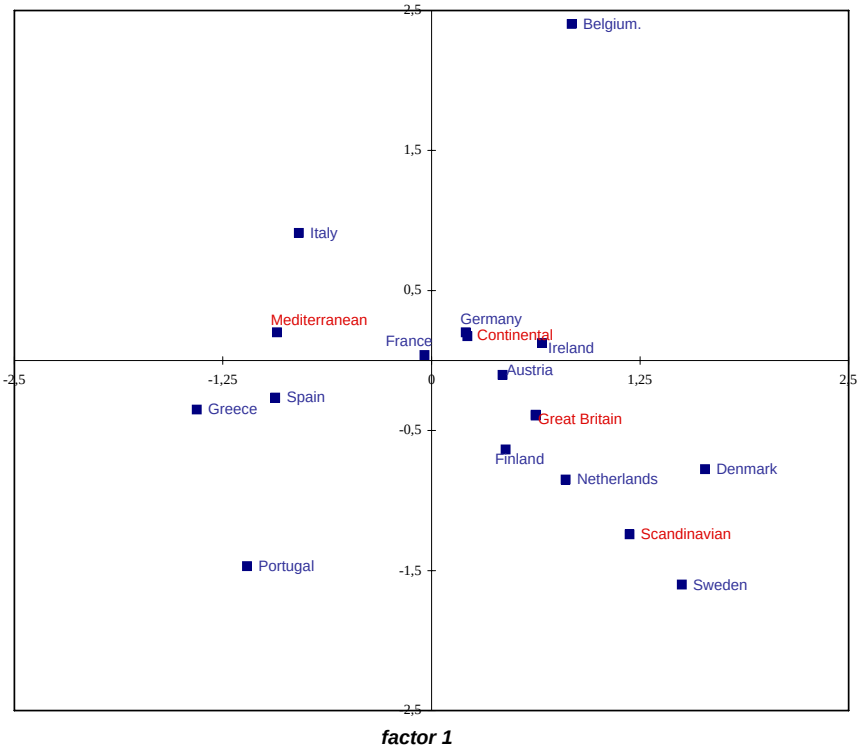


Figure 6 and 7 well summarize our previous results with respect to the different institutional settings of models of capitalism. As far as the growth model of the CONTINENTAL model of capitalism is concerned (DE, FR, BE, NL, AUT, IRL), the factor analysis shows its relationship with high levels of GDP. Household income per capita is high and regionally evenly distributed even though there is a strong variability in regional population density and labour productivity. We can say that institutions balance regional economic differences, especially in Germany. However, employability is not well distributed and strong regional disparities exist. This is partly due to path-dependence phenomena – such as population agglomeration or long-term unemployment - but it also depends on high territorial concentration of the R&D expenditure.

The GREAT BRITAIN model presents a different economic geography profile. Its growth model is strongly characterized by its widespread employability and by a large number of regions with high population density. In addition, the innovation system is quite uniformly spread among regions distributing regional growth opportunities and sustaining regional growth capability. The result is a low concentration of productivity levels and a relatively low concentration of GDP per capita and household income.

The SCANDINAVIAN model (FI, SW, DK) shows quite a different territorial pattern of economic growth. It has a large number of less densely inhabited regions and a large concentration of productivity and innovation investments in few regions. Nevertheless, wealth is produced in a well regionally distributed way and presents the highest values among MCs. Institutions play a crucial role in assuring that a concentrated economic push results in an evenly regionally distributed income for households.

The MEDITERRANEAN model of capitalism (IT, ES, POR, GR) has a regionally unbalanced mode of growth. In spite of a fairly evenly distributed population, the per capita GDP and employability are low on average and spatially concentrated. R&D investments are also low but not very differentiated in space. After the redistribution effect of the institutions, household income and long-term unemployment remain badly distributed in space. This is the most “spontaneous” of the models, with very specific agglomeration effects for different territories and little redistribution within regions.

We can conclude that different institutional macro-configurations produce different patterns of regional distribution of growth processes. In Europe we can distinguish two kinds of macroscopic regional agglomeration patterns related to macro-institutional configurations: the one prevailing in the North, based on high levels of regionally concentrated investments in knowledge, and the one prevailing in the South, with spontaneous agglomeration phenomena not driven by R&D. These growth models are further differentiated according to how institutions give form to other economic processes. Besides the universally studied problem of employability – which is best in Scandinavia and Great Britain also from the regional point of

view – institutions also play an important role in the redistribution of income. They considerably reduce regional GDP concentration in the Scandinavian area and in the Continental model.

FINAL REMARKS

This is a very preliminary analysis of European regional economies within the MC framework. We still have to investigate the labour market features, productivity, the distribution pattern of economic activities, the business and the urban structure in order to better describe the regional economy of each variety of capitalism. Nonetheless, it seems to us that regional income distribution and R&D investments depend on MC. Countries have different spatial strategies and, maybe, different regional policies. Continuing with the analysis, we investigate the relationship between agglomeration, R&D investment and the labour market features. Agglomeration plays a crucial role because it triggers knowledge spillovers and higher productivity. However, each MC shows a different territorial pattern, i.e. a different core-periphery shape that affects its regional economy structure. Our goal is to give a detailed description of such differences in order to suggest different growth questions for the European economy.

REFERENCES

Aiginger, K. and S. W. Davies (2004) "Industrial specialisation and geographical concentration: two sides of the same coin? Not for the European Union", *Journal of Applied Economics* vol.VII (2):231-248.

Albert, M. (1991) *Capitalisme Contre Capitalisme*. Paris: Seuil.

Amable, B. (2000) 'Institutional complementarity and diversity of social systems of innovation and production', *Review of International Political Economy,* 7 (4) pp.645-687.

Amable, B. (2003) *The Diversity of Modern Capitalism,* Oxford: Oxford University Press.

Amable, B., R. Barré and R. Boyer (1997) *Les Systèmes d'Innovation à l'Ere de la Globalisation*, Paris: Economica.

Amable, B. and S. Palombarini (2005) *L'Économie Politique n'est pas une Science Morale*, Paris, Liber - Raisons d'agir.

Aoki, M. (2001) *Toward a Comparative Institutional Analysis,* Cambridge Mass.: Mit Press.

Audretsch, D.B., M. Feldman (2004) " Knowledge spillovers and the Geography of innovation" in Vernon Henderson, J. and Thisse, J-F (eds) *Handbook of Regional and Urban Economics*, Volume 4, Cities and Geography, Elsevier, Amsterdam.

Boyer, R. (2005) 'How and why capitalisms differ', *Economy and Society* vol.34(4) pp:509-557.

Combes, P. P. and H. G. Overman (2004) "The spatial distribution of economic activities in the European Union", in Vernon Henderson, J. and Thisse, J-F (eds) Handbook of Regional and Urban Economics, Volume 4, Cities and Geography, Elsevier, Amsterdam.

Dore, R., W. Lazonick and M. O'Sullivan (1999) 'Varieties of capitalism in the twentieth century', *Oxford Review of Economic Policy* vol.15 (4) pp.102-120.

Doring, T., J. Schnellenbach (2006) "What do we know about geographical knowledge spillovers and regional growth?: a survey of the literature", Regiona Studies, vol.40(3) pp 375-395.

Gilly J.-P. and Y. Lung (2005) "Proximités, secteurs et territoires", *Cahiers du GRES.*

Hall, P. A. and D. Soskice (2001) 'An introduction to Varieties of Capitalism', in P. A. Hall and D. Soskice (ed.s) *Varieties of Capitalism – The Institutional Foundations of Comparative Advantage,* Oxford: Oxford University Press.

Kitschelt, H., P. Lange, G. Marks and J.D.Stephens (1999) "Convergence and divergence in advanced capitalist democracies", in H. Kitschelt, P. Lange, G. Marks and J.D.Stephens (ed.s) *Continuity and Change in Contemporary Capitalism,* Cambridge: Cambridge University Press, pp.427-460.

Krugman, P.R. (1991). *Geography and Trade,* Cambridge: MIT Press.

Krugman, P.R. and A.J. Venables (1990). 'Integration and the competitiveness of peripheral industries', in C. Bliss and C. de Macedo (eds), *Unity with Diversity in the European Community*, Cambridge: Cambridge University Press.

Lipietz A. (1977) *Le Capital et son Espace*, Paris, Maspero.

Midelfart-Knarvik, K.H., H.G. Overman, S. Redding and A.J. Venables (2000a). 'The location of European industry', report prepared for the Directorate General for Economic and Financial Affairs, European Commission, Economic papers No. 142. April 2000. European Commission, Brussels.

Midelfart-Knarvik, K.H., H.G. Overman and A.J. Venables (2000b). 'Comparative advantage and economic geography: estimating the determinants of industrial location in the EU', CEPR Discussion Paper No. 2618.

Midelfart-Knarvik H. and H. G. Overman (2002) "Delocation and European integration – is structural spending justified?", *Economic Policy* October :322-359.

OECD (2003) "Geographic concentration and territorial disparity in OECD countries" Territorial development policy committee,
http://www.oecd.org/dataoecd/43/1/15179757.DOC

Pecquer B., J-B Zimmermann (2004) "*Economie de proximités*" Hermes-Science, Paris.

Perroux, F. (1950) "Economic Space: theory and Applications", *The Quarterly Journal of Economics*, vol. 64(1), po. 89-104.

Sapir A. Aghion P., Bertola G., Hellwing M., Pisani-Ferry J., Rosati D., Vinals J., and Wallace H. with Buti M., Nava M. and Smith P.M., (2003) *An Agenda for a Growing*

Europe: Making the EU Economic System Deliver. Report of an Independent-level Study Group established at the initiative of the President of the European Commission, Mimeo, July, Brussels

Saxenian, A.L. (1994) "*Regional Advantage, Culture and Competition in Silicon Valley and Route 128*", Harvard University Press, Cambridge, MA.

Shonfield A. (1965) Modern Capitalism: The Changing Balance of Public and Private Power, Oxford: Oxford University Press.

Solari S. (2004) "Le concept de régulation dans l'étude des relations Etat-économie au niveau local", *Actes du Forum de la Régulation*, Paris-CEPREMAP, CD rom.

Whitley, R. (2000) *Divergent Capitalisms*, Oxford University Press.