

A POSTMODERN PERSPECTIVE OF GEOGRAPHY AS AN INVESTIGATING SUPPORT OF EUROPE'S KNOWLEDGE-BASED ECONOMY

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Abstract

The interdisciplinary character of geography involves a vast variety of knowledge under the two key meanings: “space” and “information”. The thematic maps are useful means to illustrate different sorts of qualified and ranked “information”, with respect to a simplified representation of the geographical “space” and provide an easy and fast visualization of possibly existing relationships among different sorts of ranked data in cases that these cannot be obvious. The Education and Research (E&R) sectors belong to the economical resources and are also influential factors of an IT based economy. This double role motivated the authors to extend the postmodern perspective of geography from only “space” to qualified “information”. Ranked information about R&D enterprises and E&R resources of six European countries are shown in thematic maps to reveal the possible impact of E&R resources on R&D sector that characterize the so-called Society of Knowledge (SK).

Keywords: *space, information, postmodern geography, thematic maps, education, research*

1. INTRODUCTION

The objective to illustrate a possible impact of Education and Research (E&R) resources upon some subjectively selected features of R&D enterprises is limited for only 6 European countries. These have been selected on the basis of the high exceed of particular figures from Europe's average to “up” and “down”. The goal has been to reveal possibly existing relationships from the statistical figures on R&D enterprises and E&R sectors for the purpose to draw preliminary conclusions about a possible dependence between the Academic Research and R&D sectors.

This investigation is based on the inclusion of E&R sectors among the assets of economical resources (e.g. Greenspan, 2001) and apparently an economical perspective of these mental sectors extends the geographical ‘space’ with qualified resources in the era of the contribution of IT based “tools” (Web, Internet etc). In addition, the ranked ‘information’ about particular resources which qualify the R&D enterprises in context of their human

resources and how these are composed may be viewed in different perspectives with regard to the contribution of Education & Research.

Independently, the impact of IT in Education (e.g Web communication, e-learning) has established since few decades a deteriorating importance of a spatial dependence of Knowledge and Research resources. Thus in context of geography R&D and E&R resources can be used mainly as qualified ‘information’ within extended civil areas for the illustration of viewpoints about Europe. These may receive many perspectives for interpreting possible relationships. In this context the particularly involved science subjects portray the existence of complex and variable processes, which depend on the approach. Within this extended view a postmodern/relativistic perspective is appropriate in selecting and ranking the “information”. The thematic mapping as a practical subject represents a visual illustration compliant to the schematization of geography by the foundation meanings “information” and “space” by adding to both ‘information’ and ‘space’ extended properties and allowing an individual choice about the mapped resources. The scheme of geography in this context is shown on Fig 1.

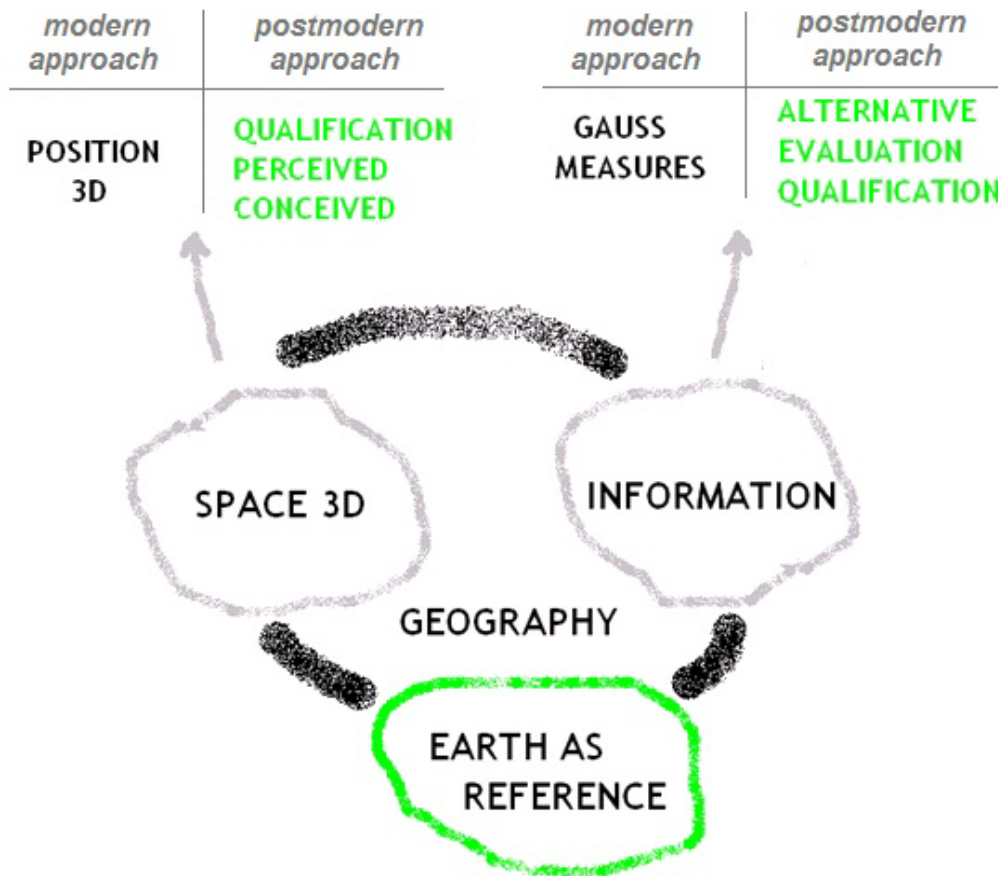


Figure1. Schematization of geography in modern and postmodern perspectives

E&R resources and statistical reports about R&D enterprises consist ‘information’ that does not portray only objective quantitative criteria. These resources can be selected according to many viewpoints and the selectivity extends the postmodern perspective of geography from only ‘space’ to the ‘information’ and their mutual inter-connection. Thus the expected unclear, possible complex models between E&R and R&D enterprises may be

revealed. ‘Space’ and ‘information’ *initiate a use and interpretation of spatial measures (distances, area) beyond their formal mapping measure.*

Education, IT and R&D are influential on individual and on macroscopic basis to the “Society of Knowledge” (SK), a term expressing the provided by technology foundations frame, within which most important driving mechanisms of the present economies may develop. A forward step to SK over the past two decades is expressed by that a part of local and regional economies are based on IT and depend on particularly qualified human resources having diverse skills. These range from skills to implement and use IT until to the ability to conceive, invent and innovate through an IT-based ‘environment’. Consequently the gradual transformation of the job “market” places and activity sectors have strongly affected in many forms traditional Education approaches. There are many viewpoints to consider this transformation, expressed in many forms (e.g. less needs of human labor, variable rates of IT literacy and respond among aged working populations). Certain viewpoints partly depend on how the E&R resources are configured and designed in the national systems. A main question is at which rate the policy about E&R contributes to the SK? The existing socio-economical ‘systems’ are expected complex and sensitive to the selected data sets. This expectation confirms relevance with a postmodern/relativistic view which includes the conceptual foundations of geography: space” & “information”.

However in the present, the term of postmodernism is used to express *a critical thinking* about meanings or models and because of the postmodernism has a relative freedom selecting, organizing and evaluating the particular types of “information” according to subjective viewpoints. The *critical thinking* represents an extended perspective to rational and framed “logic” investigations, which dominate in existing deterministic models and methods in scientific and engineering disciplines. *Postmodernism represents a perspective to view phenomena, processes and various relationships among them beyond the usual perspectives.*

Postmodernism, seems more “at home” in arts and humanities than in sciences (e.g. Good and Shymansky 2001). Its use in the perspective to select the resources of “information” and to illustrate complex relationships among them, establishes - in our belief - an appropriate approach which allows to reveal possible relationships among types of “information” which are not determined strictly neither on a formal and usual topology definition of “space” nor are based on simple statistical figures about IT-based R&D enterprises. Instead, the illustration of such ‘information’ should be viewed in less formal way, which allows configure options of complex modeling in many viewpoints and perspectives. An evaluation about the impact of mental literacy and skills in the actual working environment is expected to reveal a tendency of independence from conceived or perceived forms of geographical space, which have been perspectives given to ‘space’ beyond its logic and “modern” approach (e.g Soja 1996). A consideration of geographical “space” beyond its formal context emphasizes the unclearness, fragmentation, missing of real conformity and allows principles in social, economical, cultural and other disciplines to vary continuously by unclear, multiform and vulnerable changes in the society. This has been so far the experience with the very fast rate of IT development, of Internet facilities, the Web invention in the past 20 years.

These changes established a worldwide “new” reality and have deteriorated partly the importance of “space” in its strict objective representation and also its impact to other resources. This “reality” has been variously conceived and implemented among the states and is rooted on human resources. The sectors of education, schooling and working conditions belong to most affected ‘information’ resources, which can be influential to innovation sectors.

Europe experiences a sort of economical “diversity”, whatever are the causal sources. A part of the consequent “problems” is expressed by economical indices, including causes of unemployment, changes in many sectors, professions or occupations from the IT “revolution”.

In parallel there is a rather slow speed or hasty actions to adapt the relevant policies about education and schooling to this “new” situation. Thus, society and economy constitute the basic “culture” of SK and an IT-based “new space”, which is expressed by existing conditions in the sectors of education, schooling and research in spite that these traditional sectors seem – according to us - to “react” slower than the SK and IT in the working “market”. However, our investigation keeps partly the formality by using a “modern” means of cartography (i.e. thematic mapping) to illustrate some viewpoints and restricts to the “postmodern” perspective only about the selection of the types of “information”. .In particular we use selectively (after reflection) statistical information about E&R resources, percentage of IT and R&D in Europe and associate these resources to standard economical indices such as employment rates and GSD (Gross State Deficit)

2. AN INTRODUCTORY PERSPECTIVE OF POSTMODERNISM

For completeness, a short introductory about postmodernism is included mainly about its orientation to the role and the perspective of a contrast to “logic” models of science, without to wander among philosophical perceptions (e.g. Soja 2001). However, the dominating perspective of postmodernism has been indeed a ideology stream and in fact its usefulness has been strongly questioned for scientific fields as being “unclear or obscure” (e.g. Gilbert, 1995, Good & Shymansky, 2002). For clarifying a postmodern perspective we adopt a phrase by Knox and Marston (Knox and Marston, 2004): “a view of the world that emphasizes a range of perspectives...” In our thematic illustration of ‘information’ we feel that certain perspectives of our investigation may be inter-related and consequently complex models should be established, may be revealed.

Postmodernism in historical and cultural context, is ‘*a process* of collecting and analyzing data, and relating findings’ (Lindlof and Taylor, 2002) according to a particular perspective. An important feature of the process is the rejection of idea that a research work is based on an “objective depiction of a stable other” (Lindlof and Taylor, 2002) which is the basic thinking platform in science. Thus postmodernism may allow *alternative* perspectives in selecting resources and interpreting findings. Postmodernism encourages *reflections* about synthetic impacts caused by combined and complex reasons. Thus postmodernism is viewed as a reflective platform about data pre-selection. There are several science-based disciplines and engineering models out of geography, which meet with or experience synthetic impacts (e.g. issues of environmental approaches, hazards and all multi-parametric and not linear models). A similar feature is expected for the sectors associated with knowledge based resources (e.g. Lindlof and Taylor, 2002) and their impact in limited or extended entities of human environment, which are characterized by not purely spatial proportional rates.

While Modernism has roots in the 16th century (Knox and Marston, 2004) and has been clearly established in 18th century, the postmodernism in science – based disciplines is still shaping during the past 30 years without yet full acceptance (Griffin, 1988) or at least extensive use. The basis of difference between ‘logic’ and *critique* of "modernist" scientific mentality of ‘objectivity’ started from the “soft” disciplines like art, sociology, literature etc. (e.g. Wiggershaus, 1994). Under this context the utility of IT for individuals and for the SK can be diverse and at various stages all over Europe.

A postmodern perspective interprets a deconstruction of the geographical or civil borderlines into a *mixed qualified reality* of a combined “socially constructed space” with illustrates possible variable ‘mentally’ based ‘information’. The illustration of such composite “information” in complex space by using thematic maps, depicts individually ranked data and provides a general background for a relevant viewpoint. This sort of mapping becomes suitable frame to reflect and interpret detected complex phenomena as – for instance - the

human *phobia of IT* and of scientific “risks” or a general “*resistance*” of population to particular subjects of science and IT. These features have been recognized as objects of interpretation according to recent EC report (Report EUR22700, 2007).

A mathematical analogy “tool” for better understanding the use of postmodernism, which is strictly an individual viewpoint, can be associated to the existing scientific approaches in the study of unstable or chaotic “systems”. Such unstable systems exist in many disciplines and characterize modern engineering objectives. The quite large category of non-linear modes, whatever is their cause may result to chaotic instabilities (e.g. Bartha et al. 2009).

Therefore postmodernism should be viewed as a only a *creative platform* not closely associated to Soja’s theory (Soja, 2001). The contribution of geography to map and associate spatial “information” includes human and mental resources as many data types that are not characterized only by quantified criteria (e.g. Shannon, 1949) but instead their critical ranking, may establish a complex social-economical ‘environment’ which is not strictly based on a rationally illustrated “space” through maps or 3D representations. Thus a relatively “spatial free information” can be influential to state economies. Such “information” resources with a complex dependence on the civil space are innovations, business or commercial perspectives and related activities. The existing particular IT solutions depend on Internet communication and informatics, on the increased demands in infrastructure among educational approaches on creative thinking and on technological knowledge and skills. These represent an extended range of activities, which cannot be only “measured” objectively as “information”. For these activities the “space” receive a deteriorated importance of its topology impact and unravels alternatives for a subjective interpretation on the basis of regional or local geographical scale. .

The presently extending SK is building *a not yet organized, still in a shaping process* new platform for development beyond civil borders (Report EUR22700, 2007). IT economy is based on group initiatives, having unclear dependence on how E&R resources contribute and also on individual motivation and innovations. There exists an invisible fight between the existing forms of occupation and professions with coming up occasional and individual innovations in form of social phenomena (Eldon, 2008). This particular *social innovation* (the face-book) brought beyond the expected logic to its inventors revenues in million dollars. These raised from 52 in 2006 to 2000 in 2010 (Womack, 2010).

Therefore the critical question to answer is: What education do we need? *There is not a unique answer as in a postmodern perspective there can be many answers, which depend on how Education is conceived by its organizers and providers and what is the conceived goal.* A way to arrive to an answer is to illustrate viewpoints of the present situation in Europe among E&R, and R&D enterprise sectors.

3. A CLOSE VIEW ON E&R RESOURCES

E&R consists of organized mental resources which aim to contribute to the SK. As a whole sector they have been affected by IT in various and diverse ways as - for instance - a drastic change in the content of many branches of studies or through active use of IT in the learning modes. The present needs to adapt E&R to the new situation may receive diverse objectives such as: a) the need to review actual aims and objectives of cognitive branches, b) to apply with caution the newer learning forms c) to drastically review existing pedagogical approaches.

The diversity of the goals for such needs relates to qualified criteria and these only partly reflect to Information Literacy (IL) of population in rather obscure way. They do not contribute to IT based R&D sectors directly, as the innovative motivations can be implemented by remote work and mainly because any innovation is based on creativity, a

feature which cannot be learned. A particular consequence of the impact of these resources can be evaluated by measures on the preparedness of the society to adapt in the new working “environment” (Doufexopoulou, Bartha, 2009). Only a side of this “environment” may be detected by data of R&D activities and the relevant innovations within them.

According to a recent report of an EC expert group (Report EUR22700, 2007), we may recall a widely-recognized problem in *Europe about an existing public “unease” with the science and in particular in relation to the science which is based technologies*. This is not a simple social or cultural phenomenon but consequents after some controversial initiatives in the sectors of E&R the past two decades. There are indications that E&Rs remain *rather apart* yet from an active economy and are partly ‘isolated’ within the society. In our belief the public unease of society with IT and science, can be caused also by issues “inside” the education process, indicating examples of hasty and rather superficial implementations of IT. Such causes come from: a) the structure of human brain, related to; b) the pedagogy approach of education and schooling, which still is based on a teaching approach; c) a low attention paid for the great difference of goals between education and schooling; d) the high majority of experts and decision makers, which belong to matured generations that did not conceive the real impacts of IT and stayed in its technology features. In particular education aims to build up creativity but schooling is targeted to provide know-how and skills for particular sectors.

E&R resources have been subjected to micro-scale and macro-scale impacts of IT and these may reflect - in turn – quite different impacts to the SK. In the micro-scale IT is focused on using IT “products”, which are built by simulation of human brain operation. The human brain is extensively used to the symbols of language but it cannot replace them so easily by implementing a new symbolic system such as those needed for IT (Dowling, 1992). The brain cannot be using symbolic mechanism beyond language without a particular learning of the symbolism, and the IT symbolic models are irrelevant to brain. Cognitive scientists and researchers in associated areas assume that human cognition can be described as a symbolic system and list basic characteristics of information-processing framework, which - they say - is agreed as an appropriate way to study the human cognition (Eysneck, Keane, 1989). From their list we may argue that without setting up a reasonable motivation for learning other symbols than language, IT skills do not contribute to creativity, which is a foundation to motivate innovations.

Some textbooks on cognitive psychology (Stillings et al, 1995) regard the symbolic view as an appropriate way of looking at the brain, with connectionism as an alternative. The appeal of symbolic systems stems mainly – according to us - from two related reasons: a) they are in general relatively *simple*, i.e. easier to conceive complex models; b) They are easy to implement on computers, which is a great advantage in IT.

However, these features are irrelevant to brain, as brain systems are *not necessarily simple* or easy to implement on computers. *The motivation to learn symbolic systems in education or for schooling can be triggered by the motivation of job finding possibilities*. Instead education which aims to emphasise foundations and “values” of particular subjects, contributes to build up rather the *creativity* which can be a learned basis for the innovations.

About the macro-scale impacts of IT – which is the main object in this paragraph - we may consider that the European policy in education has shown contradictory motivations, so far. On one side the established goal of “quality” as a main competitive “force” (e.g. EC Bologna Declaration 2000) shifted to an controversial objective: of increasing or extending the SK by demanding *mobility* from large numbers of students or academics. Despite this implicit critics, the apparent actual problems in Europe’s present economy can be interpreted only partly as a side consequence of SK and IT, which grow independently without a direct connectivity to the classic economy. Consequently rather little rate of SK and IT penetrate as an active “force” built in the present economy. In particular, a large problem is the percentage

of unemployment in many sectors and this grows up because job places are replaced by automated processes and individuals have to invent new ways of professional occupation. Also several traditional professions faded out, practical knowledge and skills are fast replaced by new practical knowledge and new skills. However, the sectors of E&R respond and adapt rather slowly to such needs.

E&R resources are target and subject oriented and frequently their initiatives strongly vary between a “schooling” perspective (= learning or implementing skills) and a perspective of “education” (= learning ways to think, solve problems or innovate) *They represent two contradictory objectives that are often mixed up.* If considered that E&R places operate as “closed human systems”, several features can be met, which make difficult a *real penetration of outcome from some valuable mental work into this societies.* Such examples are:

- 1) E&R places operate as independent entities composed by rules among large but closed ‘human systems’ which consist of massive human communities that interact inside a “system” depending on policies and sponsors and is being poorly adaptive to external social changes.
- 2) E&R places depend strongly on financing sources and they are expected to follow strategies and objectives of the ‘sponsors’. Thus an E&R resource cannot be really free (Doufexopoulou, 2007).
- 3) E&R places as human systems operate with balancing small and large scale relationships within a determined “quality” and rules in a society, which keeps a high esteem for the given place but hardly can makes an active part of it.
- 4) E&R places are subject and target dedicated and thus they do not actively respond to the fast changes in science and technology.

Taking all of this into consideration a postmodern perspective on these resources seems to be the relevant approach.

4. DESCRIPTION OF THE INVESTIGATION

Our experimental illustration was initiated by three particular macroscopic observations which are not economically oriented, namely:

- 1) A widely-recognised existence of public unease with science, especially in relation to new science-based technologies. This observation is independent of a high esteem for these sectors from society (Report EUR22700, 2007).
- 2) Existing and experienced difficulties to combine fruitfully the role of E&R resources for subjects that are often composed from strongly scientific in nature cognitive sectors, although in practice they are didactically approached by mainly descriptive generalizations (e. g climate change, sustainability, environment and development etc) or through highly specialized independent subjects or are restricted to obtain learned skills (e.g. programming, data processing methods, software learning skills)
- 3) The hasty involvement of using IT in education (e.g e-learning means) without to consider - with the needed caution - the strategy of didactics for a given subject or to include concrete perspectives for the learning outcome (e.g. Doufexopoulou, Massina, 2004). In many cases the learners mix up the leaning of skills with the learning of a subject.

The investigation is restricted to draw attention that E&R resources may receive equal chances to contribute to creativity and innovations or simply practise independent mental activities apart from a variable socio-economical geographical space. However any other

similar investigation (for instance about environmental impacts and hazards) in the future should be compliant to postmodern perspective in the context of modern/realism about the existing models. The thematic maps illustrate selective records of ‘information’ through “imaging” in context of a postmodern perspective about the space/information in geography.

The illustration includes 6 European countries, which were selected after the deviation of the 3 main groups of percentage in R&D sectors profile (enterprises, state and academic institutions) from the Europe’s average to low and high rates. The countries are namely Luxemburg, Denmark, Netherlands (from western and northern part of Europe and they are higher than average in rate for enterprises and lower for E&R) and Latvia, Greece and Hungary (from eastern and southern part of Europe and they are lower than average for enterprises and higher for E&R). The relevant data are taken from EUROSTAT Report (EUROSTAT, 2010) and they are summarized in Table 1.

Table 1. Percentage in R&D sectors profile (enterprises, state, academic institutions E&R) in six European countries

Country	Enterprise %	State %	Academic (E&R) %
Europa	42	13	45
Latvia	10	19	72
Hungary	23	23	54
Greece	21	13	66
Luxemburg	83	5	4
Netherland			
Denmark	59	7	33

For these countries particular information about their R&D enterprises and Human Research resources have been selectively acquired from the already mentioned EUROSTAT Report (EUROSTAT, 2010) and these have been illustrated by 9 thematic maps for the goal to reveal visually the existence of possible associations between the two sorts of ‘mental’ resources. The maps illustrate the following selected resources:

- 1) The % distribution of R&D enterprises in companies, government and academic institutions (E&R) in each country.
- 2) The % of human resources in science and technology sectors with respect to the national population.
- 3) The % of innovative R&D enterprises over all enterprises.
- 4) The % of providing goods and services in inner market..
- 5) The % of scientists and engineers in respect to employees in R&D enterprises
- 6) The % of R&D collaborating enterprises with scientific and Academic sectors.
- 7) The % of Science and Engineering students of tertiary education (Ph.D)
- 8) The % interdivision of R&D employees as professionals, technical and ‘others’
- 9) The % innovations of R&D enterprises.

The first map is shown on Fig.2 while the rest can be viewed on the personal web site of the author (<http://www.doufexopoulou.com/EUROGEO-Athens-2011>)

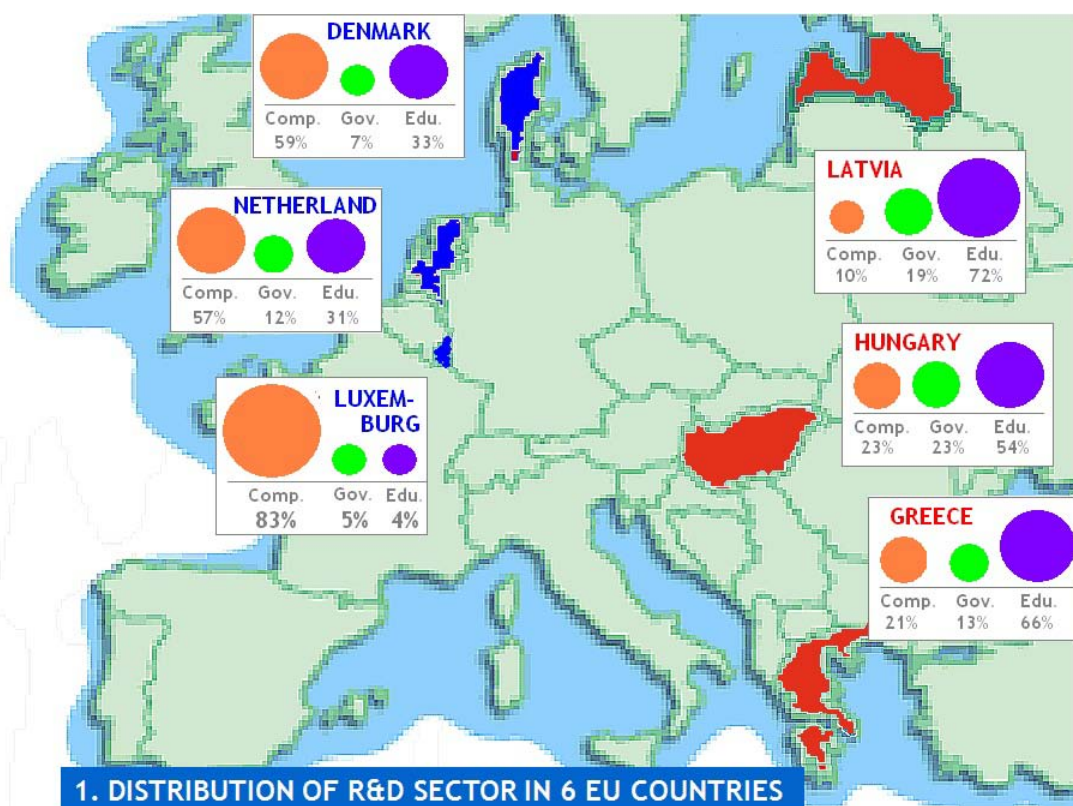


Figure 2. Distribution of R&D sectors in six European countries

5. CONCLUDING COMMENTS

A first impression is a confirmation of complex relationships among resources, which would deserve investigations by mixed professional groups.

The mapped 'information' illustrates that there is a relative irrelevance between the performance of R&D sector and the E&R resources, if the figures about Luxemburg are considered. In this minor state the 83 % of R&D sector are enterprises, only 18% of employees are scientists and engineers, there is low (18%) cooperation with E&R sectors, but the percentage of innovations is the highest among the other investigated states.

There is a tendency of difference between West and East in many respects. In Latvia, Hungary and Greece the higher percentage of Human Research Resources can be found inside the E&R sectors (72%, 54%, 66 %) than in the other 3 countries, although the percentage of innovative enterprises is about 20 units higher in Denmark, Netherlands and Luxemburg, which keep lower rates of occupation in E&R.

All six countries do not show large deviations about the percentage of occupying scientists and engineers in the total R&D sector.

However, we would consider rather hasty a conclusion – based on these findings – that the maps illustrate *irrelevance* between R&E and the performance of R&D sector. Instead we may claim that critics coming from various professionals would be needed to interpret the complexity of these findings and they can confirm that there are no simple models to associate the impact of E&R on R&D sector. It is a question of mental choice to argue that the

illustrated resources should be considered as postmodern/relativistic or modern / realistic models.

What is certain is that 'space' and 'information' in the frame of geographic approach can establish indeed quite complex relationships which depend on the particular discipline to which the acquired 'information' belongs .

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