

THE DIAGNOSIS ANALYSIS OF REGIONAL INNOVATION - APPROACHES AND OPINION

Hristea Anca Maria

Academy of Economic Studies Bucharest

Faculty of Accounting and Management Information Systems

The communitary strategic orientations that the European institutions promoted since October 2006 have at their base the fact that research and innovation have a direct contribution at the prosperity and the welfare of the individual and of the community. The main objective of the research and technological development policy promoted by the European Union is that in the following years this regional group to become the most competitive economy based on knowledge in the world. The studies have shown that the density of the local networks of knowledge and their degree of involvement in the making of a plus of wealth in the region could have a decisive contribution at the dynamism and the competitiveness of the enterprises, of the business environment, in general.

Keywords: region, innovation, strategy, methodology, diagnosis, analysis.

JEL classification: A, F,G, H, R

The promotion of the innovation policy at a regional level imposes a permanent diagnosis of the mechanisms of carrying out the system of regional innovation in such a manner that the efforts are focused on the incontestable priorities, that are the makers of added value and that we should give up the effort to decypher the meaningless details that lead to no future effects.

In the European programmes of rising the competitiveness at a regional level and of occupying the work force the regions are often the managers of a global subvention for whose use the European Commission recommends the making of diagnoses that emphasises the strong and the weak points of the territories through the perspective of the innovation so that the consolidation of some effective innovative strategies is reached in connection to the European stakes.

Romanian projects regarding the regional innovation through the scientific approach that they have in mind try to give the local managers and to the specialists from research, education, a robust methodology of territorial diagnosis and the instruments necessary for steering and innovative management.

1. The systemic approach, creative concept of innovation

In literature it is shown that *knowledge networks* represent a collective factor of economic performance and one of the most important axes of the modern politics of innovation. The notion of “society based on knowledge” has become in the last years a concept that is common to all the states that are members of the European Union. Each economic agent, manager, researcher or employee comes into contact with numerous entities in the sphere of his own unit or in other units that are situated in the same geographical area or in other regions/ countries. From the experience of the developed countries it was noticed that the efficacy and the productivity of each economic agent depends largely on the number and intensity of these connections that become more efficient when the geographical proximity is higher; because of this one of the main objectives of the European communitary politics is the development of innovation at a regional level. Frequently, the utility and the clarity of the scientific information is lost when their transmission is not made directly, through dialog, but by using informatic techniques of communication, because either the message or its content is altered. For this reason, in the making and following the putting into practice of some innovative projects the meetings “face to face” are preferred. Innovation is an interactive process. For this purpose, the production of

knowledge is necessary, but not sufficient for innovation, it creates potential that has meaning only if it exists as final demand. The production of knowledge must be capitalized through the constant interaction between producers, entrepreneurs, users or intermediaries of knowledge and the public institutions.

The fundamental role of knowledge when we talk about societies, institutions of higher education and research can be described through the image of “triple helix” (science – industry, industry – state, state – science) that is perceived as being the DNA of the economic tissue and of innovation. According to the circumstances, the universities, the industries and the public organisms can play different roles in the innovation process, around the three great actors, science – state – industry, gravitates a large variety of institutional networks. The collective decisions are the result of the complex institutional arrangements between local and national partners, in which the public collectivities play a dominant influence.

A frequent phenomenon that we can find in the modern democracies is the plurality of actors in making the politics of regional innovation. Many times they are situated on rival positions. This is why a correct institutional government of the innovation process means the creation of an equilibrium between the autonomy, cooperation and rivalry of the actors involved. In order to assure the development on the long run of the economical regions, the institutional government has to set the “rules of the game” in the so-called institutional “coopetition” (cooperation-competition); one must make the difference between the subjects that are the object of codecisions and that mean the coordination in activity, and the ones that assure the territorial dynamic through a form of rival politics. The rules of the game indicate the directions on which one can act as to obtain the maximum of effect. French literature and the literature of other European states recommends a demarcation of the action fields of the regional actors as it follows:

- Common fields: diagnosis, vision, the big axis of politics, the management of difficult priorities;
- Coordinated fields: financial and fiscal aid, incubators, the public scientific parks, the transfer organisms of technology that is financed by public fundings;
- Rival fields: the duties of the factories, the counseling in innovation and technique, the financing of the factories, the private incubators, and other actions that have effects through private efforts.

The defining of the regional policies of innovation means the deep knowing of how the regional economy works and the economical evaluation of the existing public strategies.

2. Regional systems of innovation, strategic diagnostic field

The role of the diagnostic analysis at a regional level is to identify the strong and weak points that are specific to the innovation process; it has to be methodical and to go beyond the mere enumeration of the statistical general elements (research staff, added value, investments, research expenses, number of patents) or of the list of universities, research centres, incubators, without being accompanied by argumented and scientific based commentaries.

The conclusions drawn from the analysis of a region must be completed by the diagnosis of the global stakes that are specific to the region, through the examination of the microeconomic dynamism of the actors of the innovation systems, by the appreciation of their capacity to generate knowledge and to turn it into new products and services or in “business models” (innovative) through the evaluation of the acces to capital.

The diagnosis analysis in the field of innovation at regional level is a must and it has to have three main dimensions:

- The analysis of the global components based on the indicators of economic activity and of the innovation potential;
- The analysis of the actors and of the networks of the regional system of innovation;

- The description of the functioning of the innovation government process and of the establishing the strategic priorities.

The deep description of the importance and of the dynamics of the main groups of activities allows the positioning of the specialization of the region as a strong or weak point and the making of the strategic activity clusters on which studies will be made afterwards and action programs will be implemented. The diagnosis analysis will aim at the “macroeconomic” elements of the regional system of innovation, that will be classified in the following categories: general indicators of the economic activity, human resources, financial resources, data about the innovation environment, “innovation” outputs, the dynamics of innovation.

The diagnosis is the systematic analysis of the regional activity, under different aspects, through the identification of the main indicators that can offer information about the degree of innovation of the region and by the making of comparisons between regions or the European environments, of other countries etc. The diagnosis analysis imposes the putting into practice of an ensemble of quantitative and qualitative methods among which a high degree of use will have:

- Statistical methods: indices, concentration coefficient Gini, growth rates, specific weight, medium rythms etc;
- The score functions;-
- The evaluation ratings;
- Profiles technique;
- Decomposing, grouping and comparing;
- Swot analysis;
- Pareto method;
- Questionaries and surveys.

As general lines the diagnosis means the going through the following stages:

- the identification of the purpose of the innovation analysis at a regional level;
- the determination of the influence factors, of the chance relations between these and of the methods – quantitative and qualitative – that can be applied;
- the analysis of the results and their interpretation according to region;
- proposing an action plan at a regional level;
- establishing the regional innovation strategy.
- presenting an informatic model about the evaluation of the innovation degree at a regional level.

The diagnosis will end by emphasasing the strong and weak points in a synthesis and the conclusions will lead to the making of innovation strategies of the region.

Comparison, as a qualitative method of diagnosis analysis, is best to be made by connecting the results of the region with the data of other regions and European countries. No indicator has scientific value if it is not compared in time and/or in space.

The regions used as a compariosn base in interpreting can be Romanian (them among themselves) because the purpose of this comparison is not to classify te regions, as European Inovation Scoreboard does, not to suggest to the region managers the reproduction of a model that is considered to be the best, but it only invites to reflection strating from the data presented. The major difficulty in analysing the innovation process on a national and regional level comes mainly from the limits of the statistic aparatus and from the fact that weft of the innovation is not really well localized and thus we do not have enough data for innovation.

European Inovation Scoreboard limited the analysis to a set of 7 indicators that describe the main characteristics of innovation in the European regions: the number of the staff hired in science and technology, the degree of participation to the continuous formation of the persons with ages between 25 and 64 years old, the share of the Research-Public Development (C-D) in the region PIB, the share of Research-Private Development in the region’s PIB, the existing jobs in the manufacturing fields of low, medium and high technology (% of the total occupation), the

existing jobs in the fields of high technology of services (% of the total occupation) and the number of patents at the million of inhabitants.

The present scientific paper wants to be a synthesis of the research made by the author with the occasion of the first stage of the project INNOREG – MODEL AND INFORMATIC PROGRAMME FOR THE DETERMINATION OF THE INNOVATION DEGREE AT THE LEVEL OF DEVELOPMENT REGIONS (INNOREG) – 2008-2011 (see explanations in the paper “Innovation – the cornerstone of the economic succes at an international and regional level”), in which the ASE partner had as a responsibility the study of the diagnostic analysis in the field of innovation at a regional level.

3. The selection of the indicators used in the diagnosis of the region

Although the attention of the authors in the project INNOREG is to identify an important number of indicators that can provide useful information regarding the degree of innovation in Romania – at a regional level – the experience of the European states that have tried the same procedure have shown that the analysis will limit itself only to a part of them, for reasons that have to do with the finality of the diagnosis, that has as a purpose the offering of a framework, common and simple, in an operational purpose, in the terms of public policies. The proposed elements that are a part of the diagnosis are available in general in the main informational sources (Eurostat, general indicators that are identified in every region).

The obtaining of information, that allows the making of the innovation indicators, faces an obstacle: the uncertain character of the innovation process. Tradition privileges the patents (in connection to their number and their quoting) on the one hand and the input of the research on the other hand (expenses for Research-Development, number of researchers, research staff) as being relevant landmarks in the evaluation of the innovation process. In the last years progress was recorded regarding the way of reviewing the inventions that are effectively marketed but their importance is still limited because the obtaining of information is very slow.

The problem that appears is that of determining the measure in which these differnt indicators are combined, can be substituted or are complementary. Many of the indicators that are specific to the innovation process are re-divided often in the fields of “high tech” manufacturing in the sense that each can be used as a “latent variable of the innovative performance”. The situation is in requital, much more complicated in other fields (“low tech” and services).

A study made by Autant-Bernard and N. Massard insists on 5 indicators of output that they apply on the departamental data in the case of France. The main information of output of the innovation are in their opinion: the total number of patents that have a projection in the department, the number of projections belonging to a factory that introduced innovation as a method etc.

The diagnosis of each region imposes the complementary analysis according to necessities, the research project that has to be elaborated only offers a common minimum frame of analysis and presentation, that is called to evolve in the same time with the amelioration of the statistical apparatus.

Innovation is a multiform phenomenon that can be analysed as a transformation process of the resources and that is in the same time the manifestation and the result of a certain dynamics. The French literature regarding this subject describes the different dimensions of innovation through an ensemble of components that can be analysed, each, through a set of indicators, that we enumerated above:

- General indicators of the economic activity performance: refers to the description, with the help of this subensamble of indicators of the demographic and economic global data of the region that appear more as a data base and as results of the innovation process.
- The structure of the economic activity: the structures of the activity are an “entrance” and a result; a strong orientation of the region towards “high tech” emphasises a positive performance of innovation and in the same time a favourable factor of development of new productive capacities.

- Human resources of innovation: in all the studies on innovation and territories, the degree of preparation of the human resources is one of the most direct elements in the making of the innovation process.
- Financial resources of innovation is also an important factor in all its forms.
- Data regarding the environment – the innovation environment: cultural and technical capacity of dispersing the innovations into the economy is an essential dimension that can be appreciated today through the perspective of some partial and often fragile elements.
- “Output innovation”: the dynamic of the exits appears as a particular component of the regional system of innovation because the evolution of the ensemble can manifest itself under very different forms.

These subensembles create among them a system which means that each represents on the one hand the causality elements for other subensembles and on the other hand they are the results of other components. This synergy is known and from the diagnosis analysis made at a factory level where the same indicator can represent the cause and the effect of other economic phenomena. Mutual interactions are created that generate a favorable dynamics or on the contrary there is the risk that they lose the collective competitiveness. For example, the “innovation” performance and dynamic of the region depends equally on the human and financial resources; but at the level of international rivalry regarding the human talents/aptitudes and the financing, the growth of the resources is connected to the attractiveness of the region, thus to its performances. It is only one of the examples that shows that the economical structures are connected on the long term with other dimensions of the innovation system.

Each dimension is involved in diagnosis through an ensemble of statistics available: *diagnosis is strictly conditioned by the possibilities of the statistical apparatus*. In the majority of cases the relevancy of each of the indicators that reflect the component that we are talking about, respectively innovation, would become a debate topic vast and sterile; one must make a selection and a determination of the measure in which they are combined and they have a common result; the main goal is to apply the innovation’s components in an unitary manner for the region’s ensemble.

In certain situations we will mention statistics that will be available in a near future or that are in the making right now. For example, we are talking about the limited present possibilities of exploiting at a regional level the CIS inquests. The analysis made by this organism allow us to have precise information regarding the importance and the relevance of the innovation policy in factories. Up to now this inquest was not made through a perspective of making its results regional.

For each indicator it would be useful to make simultaneously of a:

- time analysis (for a longer period, taking into account the structural nature of the given phenomena) with the positioning of the region in connection to the medium tendency of the reference regions;
- space analysis, comparisons with similar national regions or to the European regions of reference; if it is possible the comparison will be made with at least one American state and a Canadian region. For Europe a list of regions is proposed; it refers to the regions Flandra, Basque Country, High Austria, Piemont and Midland Region from the United Kingdom.
- positionings of the researched ensemble in connection to the European regions.

The different categories of indicators proposed by the authors have as a main goal the facilitation of analysis through the framing of the results, as strong/ weak points of the region according to a very strict description (swot analysis). For each subensemble a type of synthesis will be made under the form of an appreciation of the potential of the region, that is rated on a quantitative scale, from 1 to 5, mainly through comparisons with reference European regions; the interpretations will allow the emphasis of the possible and priority actions in connection to the findings made.

4. The analysis of the strategic priorities at the regional level

The methods used for the analysis of the strategic public options are very different. The strategic and budgetary decisions in general are the result of experience and inspiration of the specialist teams involved. A big importance in the making of the regional innovation strategy it has the demonstration of the share that the reasoning manner have regarding the quantitative methods. The speciality literature recommends to the public managers the specification of the personal criteria of selection and starting from this the manner in which they can build the “basic strategy”. After the processing of the information it is suggested to reflect upon the way of governing and of steering of the putting into practice of the innovation strategy in order to find viable amelioration ways. The notion of strategy, well-known in the military field, was taken and even imposed to the factories starting with the ‘70s in order to mark better the action way in an environment with rapid shiftings and that is dominated by uncertainties on all plans. The strategic approach meant the determination of the activities that “were considered to be the most interesting ones” for the enterprises.

The strategic vision imposes itself nowadays even in the public collectivities, states or regions that should identify the major stakes of the entity, the action course, the priority fields or the way in which public resources should be focused and how to identify the directions towards which it is necessary to accomplish the convergence of the local actors’ visions.

The central objective of the regional strategy is the economic development on the long term. Competitivity and the economic growth often appear as secondary compared to the objectives that are considered to be major for the region: the growth of the degree of occupation of the work force and the assurance of the social fairness. Innovation is perceived sometimes as being involved in the deepening of the social inequalities and as favouring a limited number of entrepreneurs and employees. International studies show the fact that at an international level there is a certain hesitation among the population regarding the growth of the economy as an effect of the innovation. Some authors think that innovation determines the growth of the technicalness degree and that it diminishes the role of the human work. A simple example shows that in the last decade only by the informatization of the German bank system the number of employees was reduced by 70%. In a similar manner other fields gave up their work force in favor of technology in order to cut down expenses. Other authors consider that innovation on the one hand diminishes the work demand in certain areas but it is also an important generator of new professions and jobs through the creation of new activity fields. The truth will be learned in time; at a global level poverty is still a devastating scourge.

5. The instruments of the regional politics of innovation and their efficacy

The innovation politics has as its disposal many instruments some of which we enumerate here:

- *Actions at the physical resources level:*
- Stimulating savings and investments as well as the actions that will determine the region’s attractivity for “external” investments.
- Attracting investments in education and research for:
 - infrastructure;
 - endowing the universities and the research organisms;
 - challenges for improving the quality of the research and of the university production.
- *Actions to develop the entrepreneurial dynamism:*
- Actions that tend to facilitate the innovative entrepreneurs and their judicial and fiscal environment that depends mainly on the state;
- Direct and indirect financial support.
- Supporting the creation and the growth of the innovative enterprises, owing to the infrastructure, as scientific parks, incubators or technopoles.
- *Actions regarding the interactions of knowledge between the economic actors:*
- Cells that will support the spin-off in the private universities or research center, to support the seed capital (amorçage) or of the risk capital.

- Supporting the dynamics of the innovation phenomena at the level of the economic “tissue”, especially through actions of counselling regarding the profit of the IMM, actions to stimulate the demand for knowledge, actions of transfer of knowledge after the institutionalization of the higher education.
- Supporting/ developing an ensemble of private intermediaries.
- Supporting the innovation poles policies (or of competitiveness) and of the “clusters”.
- *Actions of “policy intelligence”* what is the equivalent of actions conduct type for the improvement of the efficacy of the ways of putting into practice, at the level of defining the policies and at the level of their following.

There is a real debate regarding the economic efficacy of many of these instruments; the dominant conclusions are that public institutions that have the right to make a decision must ask themselves “what efficacy I expect from the instruments used?”, because it depends on the microeconomic circumstances and data: the selectivity and the identification process of the enterprises that support innovation, managing the competence and the efficient functioning of the knowledge infrastructures, and even the simple material realisation of the equipment in cause.

Bibliography

1. ADE et MERIT : “Fonctionnement du système d’intermédiation scientifique et technologique en region Wallonne”, Rapport final, Décembre 2004.
2. Alkemade, C. Kleinschmidt, M. Hekkert: “Analysing emerging innovation systems: a functions approach to foresight”, *Int. J. Foresight and Innovation Policy*, Vol. 3, No. 2, 2007.
3. Allan and Parry, “Fiscal Transparency in EU Accession Countries: Progress and Future Challenges”, IMF Working Paper WP-03_163, August, Washington D.C. 2003.
4. Arundel A, Hollanders H., “Innovation Strengths and Weaknesses”, MERIT, 2005.
5. B. Asheim, R. Boschma and P. Cooke: “Constructing regional advantage”.
6. “Platform policies based on related variety and differentiated knowledge bases”, Paper on evolutionary economic geography n° 07-08, Utrecht University, 2007.
7. Băloiu L. M., “Managementul inovației”, Editura Eficient, București, 1995.
8. Boier R, “Inovarea și succes”, Ed. Sedcom Libris, Iași, 1997.
9. Drucker P, “The next society: a survey of the near future”. *Economist* (online edition), November 3, 2001.
10. DIACT : “Projet de guide national d’indicateurs : indicateurs innovation, 2007”, France.
11. Procesul de elaborare a strategiei de inovare regională 2008-2013 Agenția pentru Dezvoltare Regională Muntenia Sud – Bușteni, mai 2008.
12. “Guide méthodologique pour la réalisation des analyses coûts-avantages” Nouvelle période de programmation 2007-2013, Direction générale de la politique régionale, Développement thématique, impact, évaluation et actions innovatrices, Évaluation et additionalité, Document de travail No. 4, octobre 2006.
13. Jean-Claude Prager- “Méthode de diagnostic du système d’innovation dans les régions françaises”, *Étude réalisée par l’Agence pour la Diffusion de l’Information Technologique pour le compte de la Direction Générale des Entreprises*, 2008.
14. Mairesse et Mohnen, “Accounting for innovation and measuring innovativeness: an illustrative framework and an application”, *American Economic Review*, 2002, 92, 226-230. <http://baiamarecity.ro/pdf/concordia/index.htm>
15. <http://www.clusterobservatory.eu/>
16. <http://cisad.adc.education.fr/indri/>
17. http://www.territoires.gouv.fr/indicateurs/portail_fr/index_fr.php
18. <http://epp.eurostat.ec.europa.eu/>
19. <http://www.irecson.ro>
20. <http://www.euractiv.ro/uniunea-europeana>