Theoretical and Applied Economics
Volume XVIII (2011), No. 10(563), pp. 29-44

A Cause and Effect Analysis of University – Business Cooperation for Regional Innovation in Romania

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Abstract. *This paper underlines the main roles of universities in regional innovation systems, as well as the barriers to university – business cooperation for regional innovation. At the same time, the study proposes a qualitative content analysis of Regional Innovation Strategies (RIS) that were drafted for six of the eight Romanian NUT 2 regions, in order to identify the causes of the weak university – business cooperation. Results are then shyntethised in a cause and effect map that can be a useful diagnosis and control tool in regional planning.*

Keywords: regional innovation systems (RIS); university – businesses cooperation; Romanian Regional Innovation Strategies; cause and effect map.

JEL Codes: O3, R5.
REL Codes: 16H, 16J.

1. Introduction

Innovation systems studies, whether national or regional, have emphasized the importance of universities and there is a broad literature that discusses the potential mechanisms through which they might stimulate regional innovation activity. One important transfer channel is the teaching and training of the students, which increases the knowledge of the labor force. This may also strengthen the absorptive capacity of the private sector and lead to improve innovative performance. University research itself might have spillover effects on the regional innovation system and may serve as an "incubator" for knowledge spin-offs. More, the university has a role in facilitating the access to knowledge: scientific publications, seminars, workshops, and informal relationships can also be important ways of a transfer of academic knowledge to the private sector.

The impact of universities on the economic development and innovative potential of regions has been the object of intense scholarly and policy interest in the last years. Uyarra (2008) suggests five models of universities portrayed in the literature, highlighting a different set of roles, influenced by different factors and manifested in multiple mechanisms and scales of engagement. First, universities are considered as producers of scientific knowledge—"knowledge factories", which can have a direct local economic impact. Second, university-industry studies take a "relational" approach, acknowledging a variety of links and processes for knowledge sharing between firms and higher education institutions. More recently, the "entrepreneurial" aspect of universities is encouraged via dedicated organisational arrangements in universities. Fourth, innovation system studies see universities as boundary-spanning institutional "nodes" whose influence will be shaped by the specific regional innovation system in which it is embedded. Finally, universities are further ascribed a "developmental" role in recent regional policy.

However, despite the theoretical and political emphasis on universities' roles in regional innovation studies, there are plenty of examples showing that higher education institutions are a relatively minor source of information and knowledge for creating new products and processes in firms. According to the European Innobarometer on *Strategic trends in innovation* 2006-2008, strategic partnerships to support of innovation exists particularly within the supply chain, with suppliers (42%) or with some specific (presumably large or important) customers or clients (39%). Strategic links with educational (24%) and research organisations (15%) were less frequently reported. Universities and businesses experience significant gaps in their collaboration, whose causes are related to a reciprocal lack of trust, difficulties in accessing resources for innovation,

differences in objectives, organizational cultures, timetables and expectations, lack of appropriate structures and so on.

While presenting the roles of universities in regional innovation systems and the main barriers to university – business cooperation, this paper brings evidence from Romanian region and tries to map the relationships through a cause and effect analysis.

2. Roles of universities in regional innovation systems

Regional innovation systems are just one of the so-called territorial innovation models (TIM) – a generic name for models of regional innovation in which local institutional dynamics play a significant role (Moulaert, Sekia, 2003). From these authors' points of view, at least three traditions can be distinguished within the population of the TIM. *The innovative milieu* and the *industrial district*, both with a strong focus on local institutional endogeneity, can be considered as a first family of TIM. A second tradition is more in line with the broader systems of innovation literature and is related to *regional systems of innovation* and *regional learning economies*. A third tradition stems from the Californian school of economic geography: *the new industrial spaces*. A residual category, with little affinity to regional economics but close to Porter's clusters of innovation, is the *spatial clusters of innovation* (Moulaert, Sekia, 2003). However, according to Arbo and Benneworth (2007), only three of these models have received high political affinity, especially for regional policy managers: regional innovations systems, regional clusters and learning regions, whose definitions are essential to understand the role universities can play.

Advocating the use of narrow and precise definitions of central analytical concepts as tools in empirical studies and as a basis for policy-making, at the European Union level it was decided to resume *regional clusters* to geographical concentrations of interconnected firms and use the concept of *regional innovation systems* to denote clusters plus "supporting" institutions. As a matter of the fact, to constitute a regional innovation system, firms in a regional cluster first have to form *regional innovative networks* involving more organised and formal co-operation between firms in innovation projects. D.L. Constantin (2004) appreciates regional networks are the most complex type of regional clusters, because they integrate all regional ties between companies (especially SMEs), banks, higher education and research institutions, consultancy centres, chambers for industry, producers' associations, local administrators and other social groups. The three definitions are systemised in the Table 1:

Table 1

A hierarchy of three concepts

Concepts	Definitions and differences
Regional cluster	A concentration of "interdependent" firms within the same or adjacent industrial sectors in a small geographical area
Regional innovation network	More organised co-operation (agreement) between firms, stimulated by trust, norms and conventions, which encourages firms' innovation activity
Regional innovation system	Co-operation also between firms and different organizations for knowledge development and diffusion

Source: European Commission, (2002). "Observatory of European SMEs". No. 3, *Regional Clusters in Europe.* Online at: http://ec.europa.eu/enterprise/policies/sme/files/analysis/doc/execsum_2002_en.pdf.

Thus, regional innovation systems consist of (i) firms from the industrial clusters of the region, including their support industries, and (ii) "supporting" knowledge organisations such as universities, colleges, training organisations, R&D institutes, technology transfer agencies, business associations, and finance institutions and (iii) the interaction between these actors. This idea is in line with Cooke's definition of RIS (Cooke, 2001): a region is considered to have a RIS in place when its *knowledge generation subsystem* – universities, research institutes, research associations, industry associations, training agencies, technology transfer organisations, specialist consultancies, government development programmes, etc. – and its *knowledge exploitation subsystem* – the regional industrial structure and its clusters in particular – are systematically engaged in interactive learning through knowledge networks.

From an OECD view point, *regional innovation systems* – in contrast to regional clusters – put knowledge rather than the firm in the centre of the process. More than that, in RIS, shared practices, attitudes, expectations, norms and values facilitate the flow and sharing of tacit and other forms of proprietary knowledge. Policy makers have to assure a continuous flow of ideas facilitating the right linkages that favour an interactive environment (OECD, 2007b).

As Arbo and Benneworth (2007) have emphasized, regional clusters and RIS give higher education institutions and research institutions somewhat different place. In their opinion, even many of the regional policy cluster initiatives have involved HEIs, the perspective is undoubtedly that it is the companies that create value. *Focus is on the companies and their connections*. By contrast, in the theory of RIS, the knowledge institutions are more cleary involved. The emphasis is on knowledge bases, their careers, communication channels and mechanisms for learning and sharing knowledge.

Universities are assumed to accomplish a number of different functions in a regional innovation system. According to Todtling (2006), there are four

important roles for universities in innovation systems and regional economies: „antennas" for adopting external knowledge and mediator for local knowledge circulation, source of highly skilled labour, knowledge providers in university – industry linkages and incubators for academic spin-offs, a relatively new route for commercialisation of academic inventions.

In their turn, Arbo and Benneworth (2007) have identified two waves of regional innovation systems, stressing different roles for universities. In the first one, universities were seen to perform straightforward roles, responding to the demands of key regional actors and identifying useful knowledge for networks of regional producers. It was the case of the *learning region* concept promoted by Morgan (1997), which links lifelong learning with economic and social development. For Moulaert and Sekia (2003), the learning region could be considered as an intermediate synthesis in the debate on the territorial innovation model, with a stronger focus on the role of institutions than the RIS model. However, the learning region concept was critiqued as being excessively simplistic and for failing to acknowledge the reality. In second wave models, universities are seen as bringing in external resources to regions, to create "local buzz" in such places. Cooke and Piccaluga have developed the idea of the *regional knowledge laboratory* (Arbo, Benneworth, 2007). They note that the RIS can be subdivided into two key-elements: the knowledge production sector (universities, research laboratories and commercial research facilities) and knowledge-using sector (high tech firm and commercial development facilities) and that both sectors are articulated within their own global networks of production. That's the reason why these capacities do not just have a territorial significance, but they help to position better within its own global network. As a result, the best regions are those which can produce regional knowledge laboratories with effective connections between local actors, but with global impact.

3. Barriers to university – business cooperation to support regional innovation

In 2009, the European Commission presented a set of measures to develop and strengthen cooperation between universities and businesses, as part of wider efforts to support the modernization of higher education. It was accepted that examples of successful cooperation between the two sides existed throughout Europe and EU programmes have sought to build partnerships between the two domains. However, *the level of cooperation remains very unequal across countries, universities and academic disciplines*. Furthermore, few universities have an institution-wide strategy for cooperation with enterprise; those that do are concentrated in a small number of Member States. In many countries, the legal and financial framework still fails to reward or may

even inhibit the efforts of universities to cooperate with business (*Commission of the European Communities COM(2009)/158 final*).

Effective university – business cooperation is seen as being particularly important for regional development and this theme has attracted growing attention in recent years. Too often, however, the potential for synergy is thwarted by failures of communication between regional stakeholders and higher education institutions, weak or unclear policy signals, and conflicting agendas in institutions. As resulted from an OECD review of HEIs and regions, *universities and regional business experience significant gaps in their collaborative relationships*: first, they may have divergent objectives and priorities, as well as difficulties in identifying partners. Second, universities are not always interested in research topics proposed by firms, whereas firms may favour a more professional approach than the one followed by academia. Third, restrictions on publishing research results may act as a disincentive for HEIs (OECD, 2007a).

Between 2006 and 2007, The German Academic Exchange Service (DAAD, 2006) carried out a project entitled *University-Enterprise Cooperation* at the European level. An online survey with 403 respondents in 34 countries showed there was a need for structures to promote on-going dialogue and better understanding between universities and business. A number of obstacles to cooperation were highlighted by this study. There is a lack of trust between universities and enterprises: they operate with different objectives, different timetables (universities focus on the long term; enterprises on short term results, looking for quick solutions which universities are not always in a position to provide); they have different cultures and expectations. The project produced a number of recommendations for Higher Education Institutions and the European Commission, with a view to further progress with the important dimension of University-Enterprise cooperation as one of the key elements to enhance Europe's competitiveness and contribute to EU policy and activities in this area.

The UK has a substantial amount of published data and research on business and university collaboration. Data from industry surveys in 2004 and 2008 show there remain important barriers to interaction between universities and industry. The barriers that were most important were the long-term orientation of universities as well as the lack of suitable government programmes in specific research areas. In addition, over 55% of the sample cited regulations and rules, imposed by universities and governments, as concerns over confidentiality, intellectual property and the role of the Technology Transfer Offices of the universities. The barriers that were seen to be least important were a low profile of the Technology Transfer Office, finding a suitable partner, strong orientation to basic research and lack of mutual understanding (Table 2).

Table 2

Barriers to interaction with universities, 2004 and 2008

	2004 % responding „agree" or „strongly agree"	2008 % responding „agree" or „strongly agree"
Long term orientation of university research	31.1	65.4
Lack of suitable gov. programmes to support University – Industry interactions	51.9	61.4
Potential conflicts with regards to Intellectual Property Rights	32.4	55.6
Rules and regulations imposed by governments	42.4	52.9
Unrealistic expectations from Technology Transfer Officies	24.0	49.3
University researchers seeking immediate dissemination	22.3	39.8
Lack of information about what university does	27.8	37.4
Difficulty in finding the appropriate partner	19.9	33.5
University oriented towards pure science	22.3	33.4
Mutual lack of understanding about expectations	25.7	33.0
Absence or low profile of Technology Transfer Offices	16.7	28.7
Relevant universities are too far away	7.0	10.0

Source: Bruneel J. et al. (2009).

Considering the current situation and the needs identified, two general policy objectives were established for university – business cooperation at the European level: to improve the relevance of tertiary education for the labour market and to improve Europe's innovation capacity. Universities are asked to provide incentives for structured partnerships with the business community. They should support the identification of those skills that graduates are expected to have when entering the labour market, develop appropriate governance structures, cooperate with companies to identify and provide appropriate training/retraining programmes, support the exchange, sharing and creation of knowledge through increased mobility between universities, research organisations and business (*Commission of the European Communities Staff Working Document SEC (2009)/423*).

4. University – business cooperation for regional innovation in Romania

4.1. The national context

According to the National Innovation Strategy, at the center of innovation support actions is *co-financing pre-competitive research projects initiated by companies, particularly those that involve collaboration with universities and research institutes*, together with actions that support the transfer of research results, creating innovative networks or support for investments in infrastructure.

The Study on Innovation in Industry and Services (2006-2008) published by the Romanian National Institute of Statistics highlights a weak cooperation

between universities and businesses, despite the increased number of innovative companies (one third of the total number of Romanian companies).

Thus, information in support of innovation processes was obtained mainly from own staff (44.6%) and from suppliers of equipment, materials, components and software (33.0%). Institutional sources were less used: sources from universities were used by only 3.9% of innovative companies, while sources from governmental or public research institutions were used by only 3.2%. As regards cooperation, only 13.8% of all innovative firms have cooperative arrangements for carrying out innovation. The main cooperation partners were suppliers (10.5%) and customers or buyers (8.2%). Only 5.1% of innovative companies had cooperation agreements with universities/ higher education institutions and only 3% of them with government institutions or public research institutes (Table 3).

Table 3

Share of companies involved in cooperation, by size and partener type

Cooperation partners	Total	Small enterprises	Medium enterprises	Large companies
All cooperation partners	13,8	11,1	15,1	27,3
Partners from inside the company	4,6	2,8	5,3	14,2
Suppliers	10,5	8,2	11,5	22,3
Clients/ Buyers	8,2	6,6	9,2	16,0
Competitiors	4,8	3,4	5,2	12,3
Consultants	4,4	2,2	6,4	13,5
Universities/ Higher education institutions	5,1	3,5	5,3	14,7
Government institutions/ public research institutes	3,0	1,3	3,8	11,8

Source: Institutul Național de Statistică (2010), "Inovarea în Industrie şi Servicii în perioada 2006-2008". Online at: http://www.insse.ro/cms/rw/pages/comunicate/inov_ind.ro.do**.**

The analysis of regional innovation supply and demand confirms the results of national statistics, as presented in the following part of this study.

4.2. Research question and method

This study proposes a qualitative content analysis of Regional Innovation Strategies (RIS) that were drafted for six of the eight Romanian NUT 2 regions, namely: Bucharest – Ilfov (BI), North-East (NE), North/West (NW), West (W), South – Muntenia (SM) and South-East (SE).

Regional Innovation Strategies were drafted following a SWOT analysis of regional innovation systems. The analysis of innovation supply and demand was carried out using both secondary data analysis (European and national official statistics) and primary data from field studies with innovation actors: companies, researchers, public authorities and so on. The following research

question will be answered by this study: *Which are the* causes *of the weak university – business cooperation for regional innovation in Romania's regions?* The research proposes qualitative inferences and follows the classic framework of qualitative content analysis (Adams et al., 2007): identify the units of analysis (the regions), choose a set of categories (causes of the weak university – business cooperation), coding and assignment of assertions to one of the categories, tabulate, illustrate the results and drawing conclusions. All results were visually captured in a cause and effect map (Annex 1).

4.3. Research results

The Regional Innovation Strategies reveal a weak university – business collaboration for innovation.

Weaknesses in Bucharest – Ilfov region are those related to: *low levels of cooperation between R&D sector and industry, non-correlation between the researches conducted by universities and research institutes and the real needs of SMEs,* as well as *poor protection of intellectual property rights.* To some degree, the situation is somewhat different depending on types of activities: for example, the ICTs and electronics sectors recorded a higher level of collaboration between universities, research centres and companies, especially due to the INFRATECH program.

An insufficient level of collaboration between SMEs and universities/ R&D units is also highlighted in the North East Regional Innovation Strategy: *cooperation with universities and technical colleges has been declared the only cooperative relationship by one in three companies,* but all respondents have reported the intention to begin this process. Collaboration wasn't reported as tights or regular. In spite of this, former collaboration has led to good innovative results, *because most universities and R&D centers are interested in developing such activities.* Regarding the technology transfer from universities and research institutes to businesses in the North West region, one can appreciate the following: *cooperation with businesses is weak*, *research centers do not receive applications from companies* and *there are a few national or European research and innovation projects that engage companies*. Closer collaboration exists within technical fields such as chemical engineering, petroleum, pharmaceutical industry, machinery and equipment, computers or food industry.

Weak points in collaboration are also reported in the West Region: few partnerships between R&D providers and companies, low capacity to adapt to market condition, a reduced number of young people who remain in universities and research units to work in research – because they prefer other jobs, with higher salaries. Contracts with companies are up to 25% of all contracts undertaken by research centers in the West Region and they bring about 19.65%

of total revenues. Not all the institutes in the region have adapted easily to the market economy. Probably, due to their specific profile, *some institutions remained dependent on government financing and couldn't find business partners interested in their research results*.

In the South Muntenia Region, local SMEs have partnerships with universities or research institutes, but the level of cooperation is very low. This kind of collaboration *is not a priority for regional businesses,* and most of the partnerships are concluded in order to apply for European programs.

The partnership in R&D activities between enterprises and universities/R&D institutions in the South East Region is still at a low level and mainly based on scientific collaborations. The cooperation driven by economic demand is very poor and very few projects are financed by private companies. At the same time, regional disparities are very pregnant, and therefore, there is an unbalanced repartition of investments over the region territory. Galati, Tulcea and Constanta are among the most active counties in research and development. *For businesses, innovation is a rarely used word.*

There is also some evidence from the other two NUT2 regions in Romania. Thus, according to the Central Region's Development Plan for 2007-2013, there was a dramatic decrease in collaboration between technology transfer centres at universities and industry after 1990. Economic transformations in the region, together with the lack of performant institutions in scientific research and technology transfer are the main reasons of the decrease. At the same time, the South West Development Strategy (2007-2013) points out some weak points in cooperation: applied research is limited to large enterprises, research infrastructure is poorly developed and there is a low degree of applicability of universities' research results.

The main causes of weak cooperation between universities and businesses were clustered under four cathegories (services/offer, communication/ marketing, perceptions/ attitudes, resources/ structures) and are detalied below.

■ *SERVICES/ OFFERS: Universities' offer is not in line with market needs.*

The analysis pointed out that one of the main reasons for the low level of cooperation for innovation is the lack of correlation between universities' research objectives and those of businesses. As shown in the South Muntenia RIS, *universities' fundamental research is widely recognized nationally and internationally, while applied research projects are not linked and oriented towards the needs of the regional economy.*

In the North-West Region, there are few services offered by universities, research institutes or development centers to the business community; more than that, the offer has a poor applicability – especially for socio-humanistic field. A greater number of offers is avalilable for technical areas.

Most research units have agreed they could develop a wide range of training courses for enterprises, but only half of them were able to exemplify. When

developing service offerings, universities generally do not collect information from the businesses (due to a lack of communication), but take into account the European market trends or the themes from their own research programs.

As resulted from Bucharest – Ilfov and West RISes, an important obstacle to university – businesses cooperation is the unclear or inappropriate offer of R&D providers. From an organizational point of view, the challenge is to shift emphasis from fundamental research toward applied research or to transfer research results in innovative products and services on the market.

■ *COMMUNICATION/ MARKETING: There is no coherent cooperation strategy for university – businesses relationship and the R&D offer is not adequatly promoted.*

Lack of marketing strategies to promote the R&D offer is another cause of poor cooperation between universities and companies. As regarding the marketing policy, only half of the R&D units in the North-West region consider their activities are known by enterprises, especially through professional articles in scientific publications and through participation in fairs, exhibitions and seminars. There are few visits to companies or other organizations and few promotional brochures, catalogs or audio-visual materials. For external information and communication, the interviewed units widely used journals, databases, conferences and, to a lesser extent, feedback from suppliers, customers and technology centers.

According to Bucharest – Ilfov Regional Innovation Strategy, there are some external restrictions that lead to a less profficient activity for innovation: insufficient information about sources of funding or innovation support infrastructure, asymetric information on providers offering innovation and, to a some degree, limited advertising and communications actions.

The conclusion of the analysis form the North-East Region is very convincing in this respect: *there is a clear lack of accurate and productive channels of cooperation*, *and, in some cases, a lack of institutional communication*. To these, they add poor managerial skills of researchers. As to the South Muntenia Regional Innovation Strategy, researchers and teachers lack the entrepreneurial culture. Moreover, commercialization of research results is an almost unknown concept for researchers, while the spin-off initiatives are relatively absent in R&D systems.

■ *PERCEPTIONS/ ATTITUDES: Research is perceived as a purely scientific issue and that perception leads to anti-innovation attitudes.*

Another weakness identified in the Regional Innovation Strategies was the entrepreneurs' lack of awareness regarding the benefits of research and innovation, together with a persistence in their lack of interest for innovation.

On the one hand, the findings of the North East Regional Innovation Strategy indicate that research is perceived *as a matter of purely scientific and academic interest,* while innovation is seen as *an expensive activity, without tangible benefits in the short or medium term*. On the other hand, SMEs have not matured

sufficiently a clear vision on the role of universities and R&D centres, whose potential is not sufficiently known and, sometimes, is underestimated.

The South Muntenia study highlights the lack of business awareness of the benefits resulting from the RDI. *In most case,s innovation is essentially equated with product and process innovation. Innovation itself is considered to be an expensive activity, without tangible benefits on the short and medium term*. Innovation culture is in its early development phase for regional companies. Thus, the vast majority of entrepreneurs do not consider innovation as one of the important factors for business success and are reluctant to undertake innovative activities. They often prefer to use "ready-made" solutions and to purchase equipment, technologies, software, etc., rather than to fund internal or external research. Developing cooperation with the SMEs has been reported to be low and difficult; researchers complain because of entrepreneurs anti-innovation attitudes and their low interest for cooperation.

To these, one can add the lack of an innovation culture, low awareness of innovation benefits in order to become competitive (North-West RIS), the lack of motivation for the R&D activities, and, consequently, low investments in research and innovation (West RIS). According to Bucharest Ilfov analysis, business representatives believe *problems can be solved internally because the external solutions are very expensive*. In addition, they prefer short-term profits in detrriment of long-term development strategies. Finally, according to the South East analysis, most of the companies have difficulties in defining innovation as concept. For some of the organisations, innovation means research, for others technological transfer or new ideas, products and processes: *for businesses, innovation is a rarely used word.*

■ *RESOURCES/ STRUCTURES: Limitied financial and logistical resources. Inefficiency/lack of regional support structures.*

As regarding universities, the North East study shows that there are no modern equipments for R&D activities nor in universities, not in R&D units. The North-West RIS highlights the inadequancy of equipments and facilities, a lack of specialized staff, low level of access to international databases, laboratories that do not comply with European regulations etc. As mentioned by West Regional Innovation Strategy, a small number of young people remain in universities and research units because they choose better-paid jobs. The interim analysis of West RIS has revealed a very important detail, namely that there is a risk of increasing dependence of public funding in detriment of resouces from enterprises.

From a business point of view, lack of adequate resources is mentioned as follow: entrepreneurs have a weak co-financing capacity and have difficulties in finding qualified staff to use of technologies and/ or innovative materials (Bucharest – Ilfov study). Some of the main threats commonly found in the R&D analysis are the lack of access to sources of funding or the lack of

competitiveness of the projects submitted in this regard (West RIS), as well as the lack of financial resources to be allocated to activities with long-term profits etc.

All Regional Innovation Strategies highlight the inefficiency/absence of intermediary support structures for innovation. On the one hand, there are no interface structures within universities (eg. technology transfer offices, departments for corporate relationship, industry liaison offices). On the other hand, the interface structures within companies, if any, are poorly developed.

Creation of an integrated regional innovation support structure is the solution that transcends all RIS studies. Acestea pot fi una dintre soluțiile care să ajute la relansarea sectorului IMM din România, afectat profund de criza financiară. According to a survey conducted in 2010 by CNIPMMR in the eight regions, half of SMEs claimed to be severely (25.49%) or very severely (23.53%) affected by the current economic context (Visinescu, Micuda, 2011). The West RIS mentions it's necessary to establish a Regional center for technology transfer, in which to know about both sides, to readily identify potential customers and to attract research funds. The South Muntenia RIS proposes the establishment of *information circles*, where leaders of innovation in the region, persons from academia and companies' representatives can meet and creat collaborative innovation groups. The North West RIS mentioned as being necessary to establish a Regional institute of technology transfer and to create databases for regional supply and demand innovation activities. The North-East RIS proposes the creation of spaces for knowledge transfer within the universities and research centers, with special attention to creating new companies based on new technologies.

The establishment of these centers will activate the strengths of the educational and research system in Romania: the existence of well known research centers (Bucharest IlfovI) or of business incubators and science parks (South-East), closely related to the predominant industries in the region (South Muntenia), the technical expertise of universities (North-West), their research potential (West). To these one cad add the training potential for future research specialists and the potential to provide quality business services (North-West), together with researchers' commitment and interest to have R&D activities (North-East).

Conclusions

Results of the previous research were shyntesised in a causal map.

A causal map can be a useful tool for both practitioners and researchers in many ways, as a diagnosis, communication, risk mitigation and control tool (Adams et al., 2007). A causal map is a network diagram representing causes and effects; it contains two basic elements: concepts which are the nodes in the network and causal relationships which are represented by the arcs between the nodes (Scavarda et al. 2004). "Cause and Effect" diagrams are frequently used

in quality management to illustrate how factors may contribute to a target effect, and help to order these into broad categories.

The cause and effect diagram presents many advantages. First, it provides a representation that facilitates a simultaneous viewing of areas for intervention. Secondly, the map dissociates the causes and effects and thus can become a useful tool in the diagnosis and control of regional planning. Finally, the great advantage of this map is that it presents the logical sequence of interventions that are appropriate to achieve the desired effect: stimulating cooperation between universities and businesses.

As the map illustrates, the first intervention is required to be done on resources/structures. Opportunities related to the EU policies that support R & D or the possibility to access structural funds during 2008-2013 can provide solutions to the lack of resources for innovation. At the same time, they can give impetus to the creation of liaison structures, without which there can be no coherent and sustainable cooperative relations.

As it can be seen, the absence of these structures creates other causal relationships. For universities, the lack of liaison offices makes their offer to be unclear, inappropriate or with poor applicability. At the same time, companies are required to appoint liaison officers, boundary agents or technological agents, whose role is to take new information from external sources, decode it, disseminate the results internally and use it in innovation processes.

Finally, as illustrated in RIS studies, the establishment of regional structures that support effective innovation is a sine-qua-non condition for the creation of a regional innovation systems. Otherwise, as happens now, the lack of a formal framework for interaction leads to the persistence of anti-innovation attitudes amond business representatives.

The creation of support structures could also solve the deficiencies related to communication and marketing activities. Liaison offices have to draw coherent cooperation strategies, foster the dialogue to identify real needs, disseminate the research results etc. In the absence of a structured dialogue, universities' offer for businesses becomes uncopetitive and won't attract companies' attention. A vicious circle is thus created: in the absence of demand, universities and research centres are not stimulated to improve their offer and this situation creates an attitude of distrust from the part of the businesses.

Changing perceptions towards research and the anti-innovation attitudes is probably the most difficult, but also the most important task in fostering dialogue between universities and businesses. As noted above, universities should prove their reasearch's utility and change Romanian entrepreneurs' visions about the importance of innovation. If a sense of mutual distrust persists, then "forcing" university – businesses interactions will only serve to stimulate opportunism in accessing funds and not the promotion of sustainable innovation.

Aknowledgements

This work was cofinanced through the European Social Fund through The Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/1.5/S/59184 „Performance and excellence in postdoctoral research in Romanian economic science domain"

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Annex 1

A cause and effect map of university – business cooperation for regional innovation