

# The Roles of the Universities in Innovative Processes

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## **Abstract**

This paper deals with the analyzing of the universities role in modern innovative processes what take place in entrepreneurs and firms. Innovations are one of the tools for regional competitiveness increasing. There are many institutions what can help to increase or make better the innovative processes in firms in region. One group of these institutions is Universities.

## **Key words**

Innovations, innovative processes, universities, modern policy

## **Úvod**

From 2003 to 2008 we have noticed the expansion phase of economies. In this period many entrepreneurs realized innovations for their competitiveness increasing. Many firms but used the benefits from expansion period, spent money for consumptions and gave no money to investments (mostly investments to innovations). Now during the economical crisis periods these entrepreneurs must solve existence problems, because they have not competitive advantage and the decreasing demand decreases their earnings under the existence minimum.

The next development of currently competitive advantage means to compete by the low prices of the inputs and low prices of the outputs, but the earnings must stay on the same level. But this way is not maintainable, because the biggest competitors are firms from China, India and Brasilia. These countries can produce the same goods but the have lower costs because labor force is cheaper. But the competitive advantage flows not only from low costs, but also from the technologies and quality standards.

Presented facts document the huge need of modern innovative policy (complex public policy what can help and support the innovative activities of the firms lead to increasing of their productivity like the fundamental framework for the long-time economical development supports). This economy must be founded on the knowledge economy there the fundamental factor of the competitiveness is not the price, but the ability to create and commercially use the knowledge (for more see Porter, 1990).

The important process during the innovative policy draw is to take into account the networking, social systems and networks in globalize economies. In this view the importance of the locality or region as the basement for supporting economic development approved<sup>1</sup>. The policy of the innovations supports tends to knowledge economy and the specifics of every region must be taken in to account. The actual attitude in developed countries is the creation of the *regional innovation systems*.

## 1. Regional innovation systems

Regional innovation systems (RIS) are complex phenomenon what have no strict definition because of their internal dynamics. RIS can be apperceived like the network of the connected firms and institutions among them the changes of the information and knowledge are realized. There many forms of cooperation take place too. These processes support the innovative productivity or competitive advantage of the local firms.

In the RIS there many cooperation relations among entrepreneurs and research institutions, universities and public administration offices can be found. These relations but must be very deep and strong, not only in the paper form<sup>2</sup>.

RIS can be divided into two basic subsystems which are the key factor for innovation creation processes:

- (a) *knowledge usage* (applications) *subsystem* – make by firms, suppliers, customers etc.,
- (b) *knowledge production subsystem* – make by public and private research institutions and universities.

Except mentioned subsystems the supporting infrastructure is the important component of RIS. This infrastructure can be in physical form (modern information and communicational technologies what can get fast the communication and information changes). Next form is institutional what preset these institutions:

- research parks,
- entrepreneur incubators,
- innovation centers,
- centers for technology transfers and many others.

The important thing is the quality of the supported services. In practice we can see that the infrastructure is built, but not according to the needs of firms and organizations, but according to “paper” (bureaucratic) settings.

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<sup>1</sup> Approved in publications of Cooke et al. (2004), Martin (2003).

<sup>2</sup> For more see Lundvall, (2007), Asheim, (2006), Cooke at al. (2004)

The public institutions must support the innovation and knowledge transfer by the specialized services for example – laws, financial and accounting services, marketing, research and consultancy services.

But “physical” existence RIS is not the support factor. The main meaning of the RIS is the quality of the relations among the firms, institutions and public administration offices and processes of learning, connectivity, and cooperation. The important role the motivation and ambitions of the RIS actors play. These soft factors of the competitiveness are the key factor what can differentiate the successful from un-successful regions.

The meaning of RIS is in minimalization of asymmetric information and transactional costs. The asymmetry decreasing is one of the modern trends applying in big companies (for example they ooze through the research and marketing development; production and construction development). They have no four teams from four developments, but 4 teams with the representatives from all four developments.

## **2. Innovation process with Universities participations**

During the innovation process exploring the innovations must be divided into two groups according to their impact to the economical development:

- radical,
- incremental.

Radical innovation is that what can bring the important change in continuous development. The innovation is based on the new knowledge usage (use the fundamental research results). The universities of the technical orientation can realized their own results from research. This innovation brings also new technologies (for example nanotechnologies). They need not be very expensive, but the usage is the competitive advantage for the firms and also for the research institution and region.

Incremental innovation represents mostly new combination of existing knowledge or their usage in new context (or for some other function). These innovations can partially lead to new quality of the product or service. Their appearance is more often, because they are needed part of firm development. Because only with this type of innovation can every firm has own competitiveness and can react the technological development in all world globalized economy.

The fundamental source of innovations is the obtaining and applying new knowledge. The sources of new knowledge are mostly universities and university research developments and centers. There are two models for obtaining new knowledge in region.

*Linear model* of innovations is based on the observation that some innovations birth in direct order of some activities. These activities are realized usually in one region but locality. The university can be that locality for linear model innovation birth. The universities with most quality basic and application research are able to offer the basement of innovations to firms and companies from civil sector. The specific way of cooperation is the spin-off firms what can be used for commercialization of the knowledge in practice. But the practice of last years shows that the linear model of innovations presents more simplification of the whole process. In many examples the fundamental elements of the innovation process are results of very difficult and complex (and also accidental) constellation of relations and cooperation of many subjects in region and also external subjects.

*Interactive model* of innovations is not discordant with linear model. It is more complement in the meaning that the knowledge doesn't create locally, but in network of relations framework (not only in one region or country). The results of this model are regionally used.

The difference between linear and interactive model has very important impacts in practice level. In Czech Republic the regional innovation strategies are applied and they are based on the linear model. In every region the university must be established, because in region without the university can not be developed the innovations. But this aspiration is not right.

Universities can support innovation activities (intensity and also character) of local firms. Some universities can also establish the new firms. They are established for commercialization of the innovations and results from the research activities of the universities and research departments.

The next roles of universities lies on the education (creating) of high-educated professionals which have own know-how, originally ideas and objectives of their interests. And these employees must know how to transfer the knowledge from university environment to the practice (and also how to commerce them). These successful persons create the new firms where the transfer is held, but they stay partially in academic field to be near to the innovative environment, new knowledge, synergy effects from close working teams etc. That is why they can apply knowledge with high value added. This connection is very helpful also for universities. They can use the new firms with grants solutions, innovate the education processes and create new subjects and get better the competence profile of the university graduates. The described connections bring more benefits – for example

creation new jobs, increasing GDP, knowledge transfer, number of patents etc.

But described situation is found only at several universities (a few institutions in the country). Some of them create the connections and cooperation, but only in “administrative” level. This is situation of young universities. In Czech Republic there many examples can be described.

The usage of synergy effects flow from relations with private sector and universities in research field have some risks:

- the top specialists have tendency to very high concentration to the biggest cities and the top institutions;
- young universities (especially private owned) have no top specialists, this group of employees must be created in long time. It brings polarization of the knowledge in country because the specialists don’t want to work in “low quality” institution and they block the increasing of education these institutions and their employees;
- the most talent students will preferred the “old” universities, the low quality level students (who has not ever enter the old university) now enter the young university, but they ability to create new innovation is limited.

The research and development present with the quality of human resources the fundament of innovation potential of regions and they are the fundamental inputs of innovation processes. The research and development have the strong tendency to concentration to the main cities of the economy. The non-main cities the research and development activities are concentrated in private sector – in entrepreneurs and companies. Universities play only the administrative role of the “partner” of these innovative activities.

That’s why the non-metropolitan cities don’t have innovation potential, the research and development realized in companies tends to one-side (only to companies), doesn’t use the benefits from synergy and interaction with other development activities in the region. Very useful way how to change this situation is to create or cooperate in industrial clusters. There the companies, institutions of public administration and research universities can cooperate and use the synergy effects. This way can to rescue the technology and knowledge transfer in non-metropolitan regions. For industrial clusters see more in Stejskal, Kovárník 2009.

## **Conclusion**

Activities of research and development are the fundamental source of innovations. There is no determinism that innovations will create only

where the research and development have basement. This premise is not right what can be documented by many examples from practice. But the universities in regions must try to enter the partnership with the private sector companies, must obtain the top specialists and make stronger the university role in innovation process.

The importance from innovation capacity of the region doesn't lie only in existence of quality research-development basement, but also in access of private sector to results of research-development institutions (the results can find the commercial use and can contribute to the competitiveness increasing of the regional players). That's why the interactions among players in region are the fundamental substance of innovation potential and knowledge and innovation circulation.

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