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Dorota Czyżewska

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*Dorota Czyżewska**

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Abstract

In a knowledge-based, globalized economy the challenge is to create a supportive underground for the development of multi-stakeholder networks and new forms of cooperation and relational exchange where knowledge is generated for the need of innovations launched by the firms. The aim of the paper is to examine the importance of institutional support of regional innovativeness in Rhône-Alpes region in France.

1. Introduction

Nowadays economic growth and competitive advantage of states and regions depend increasingly of the appearance of firms launching innovations on the market. As a result, efforts of public authorities are focused on the development of entrepreneurship and innovation processes. Transformation of knowledge into new products, services, technologies or organization innovations demands an adequate set of innovation support institutions. In this

* The author would like to thank an anonymous referee for comment. All remaining errors are those of the author. The author is a Ph.D. candidate at Poznan University of Economics, Faculty of International Business and Economics, Department of Strategy and Policy of International Competitiveness. The author's e-mail address: d.czyzewska@ue.poznan.pl.

context the role of science and technology parks, business incubators, technology transfer institutions is of key importance. Furthermore, innovation processes are no longer perceived as a single phenomenon, but as a system of interconnections involving business networks, R&D institutions, regional and local authorities, citizen initiatives and innovation support institutions. Regional development is more and more based on network relations between these actors of a region and fuelled by the needs of local population. The challenge of innovation support institutions is to stimulate people's innovation capacities and their entrepreneurship as major measures of regional innovativeness (Dzierżanowski et al. 2008, p.7).

The aim of the paper is to examine the importance of institutional support of regional innovativeness in the context of the knowledge-based economy. The paper is divided into three sections and conclusions. In the first section an overview of innovation supporting structures is proposed, section two underlines the role played by these institutions. Section three investigates the significance of some innovation support institutions in the regional development of Rhône-Alpes in France. The conclusions contain a summary of the considerations resulting from the analysis.

2. Innovativeness at the regional level

There is a widespread agreement in academic literature that knowledge and innovation are key to competitiveness and economic development not only for firms, but also for regions and nations (Rybicki et al. 2008, p.299; Tödtling et al. 2005, p.1203). In the knowledge-based economy regions have competitive advantage over the others only if they are innovative. The innovativeness of a region is defined as its capacity to change, to introduce reforms and new solutions in different aspects of social and economic life of a region in order to improve the

effectiveness of mechanisms responsible for regional development. As the region is a complex system of elements, regional innovativeness is characterized by the capacities and behaviors of its actors. To establish the level of regional innovativeness it is useful to take into consideration some factors that influence production, diffusion, absorption and innovation transfer in a region: companies localized in a region, R&D potential, institutional infrastructure supporting entrepreneurship, social and human capital, regional authorities (Chądzyński et al. 2007, p.144).

Innovativeness level of regional companies can be stimulated by the following factors:

1. Market and institutional conditions creating competitiveness climate in the economy;
2. R&D investments and capital accumulation;
3. Promotion of intellectual property rights;
4. Economic diversification of regional industries;
5. High level of education;
6. Life-long learning adapted to the needs of the local labour market;
7. Existence of universities and R&D institutions;
8. University-industry collaboration;
9. Cooperation networks at the regional level;
10. Innovation support and technology transfer system;
11. International and intraregional cooperation (Chądzyński et al. 2007, p.146).

Regional authorities have a direct or indirect impact on the aforementioned factors by coordinating and promoting international and intraregional cooperation, enhancing university-industry collaboration, providing financial support for education programmes of all levels or attracting new investors to the region. The role of regional authorities is to support innovation processes by offering services and other mechanisms adapted to regional needs in order to strengthen the interlinkages between all the involved actors (Cooke 2006, p.5). These are only

some examples of initiatives that make regional authorities involved in the process of regional innovativeness creation.

Regional innovativeness depends on the capacity of public institutions and private firms to produce innovations, but it is also largely influenced by the effectiveness of the technology transfer system and a set of institutions supporting the innovation processes at the regional level such as business support centres, science and technology parks etc. (Stachowiak 2008, p.123).

According to the results of theoretical and empirical analyses of Amin and Thrift (quoted by Stachowiak 2008, p.124), institutional thickness - a particular configuration of institutional factors - is needed for the economic growth and as a stimulator for regional innovativeness. Institutional thickness refers to the existence of local institutions and organizations, high level of interactions between these organizations, involvement in common projects and structure of local authorities. It would be misleading, however, to consider that every region should use the same configuration of institutional factors to achieve high level of its innovativeness. The specific strengths and weaknesses of regions in terms of their industries, knowledge institutions, innovation potential, historical and social background of a region require a more differentiated approach (Tödtling et al. 2005, p.1204).

3. Typology of innovation support institutions

Assistance to firms in satisfying knowledge, skill, finance and other needs, when market fails to provide, can play an essential role in their success; global and local network relations are considered of key importance in this process (Cooke 2006, p.3). A wide range of innovation support organizations seem essential in the acquisition and diffusion of technological ideas, know-how and solutions throughout the innovation system.

In economic literature there exist various typologies of innovation support institutions (Piotrowska-Trybull 2005, p.23-52; Cichowski 1996, p.157-166; Woodward 1999; Mertl 2001, p. 101-124; Przygodzki 2007, p.149-150)¹. In this paper the typology by Matusiak (2001, quoted by Dominiak 2009, p.191) is demonstrated in which five types of institutions are enumerated:

1. Science and technology parks;
2. Business support centres;
3. Technology transfer institutions;
4. Business incubators;
5. Local guarantee funds.

According to a definition formulated by IASP, a science park is ‘an organisation managed by specialised professionals, whose main objective is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions’. Being the most conceptually developed innovation support institution, a science park and technology stimulates a shift of regional economy into a knowledge-based economy. The aim of a science and technology park is to manage a flow of technology and knowledge among universities, R&D institutions, companies and market. It facilitates the creation of knowledge-based firms by means of spin-off and incubation processes. Science and technology parks enhance regional innovativeness by giving new business opportunities and added value to existing firms. By fostering entrepreneurship, they create knowledge-based jobs and enhance the synergy process between science and industry (www.iasp.ws). A wide range of services provided by a science and technology park is unique for every region and its potential largely influences the regional economy (Marciniak 2007). There exist reciprocal relations between science and technology parks and regional development in terms of innovation. On the one hand, without pro-

innovative regional environment the effective functioning of a science and technology park is difficult. On the other hand, the results of science and technology parks' activities contribute to enhance innovative skills of a region and play a major role in a regional innovation system. Science and technology parks influence directly the region by restructuring its economy and improving its innovation capacities. The indirect effect contribute to the creation of social capital in the region, of cooperation networks and of good image of a region (Matusiak 2009, p.166).

Business support centres originate in a public policy initiative. They are non-profit organisations that aim to assist firms to develop their business activity with success and to meet the challenges of their business projects, social and physical environment (CEC 2001; Burdecka 2004, p.64). Their activity is concentrated on providing counselling, information and education services adapted to the requirements of local labour market but they serve also as intermediary institutions in technology transfer and commercialization. Services provided by business support centres respond to the need of reinforcement of regional innovativeness and they are in favour of fostering the entrepreneurship in the local economies (Matusiak 2007, p.33; Mażewska et al. 2009, p.403).

Technology transfer institutions such as industrial liaison offices, contract research organizations, technology transfer centres and other innovation providers play an increasingly important role in the creation and strengthening of the interactions between industry and research organizations such as higher education institutions and public sector research establishments (*Technology transfer institutions in Europe* 2004, p.6). As stated by the OECD (2003), the role of technology transfer institutions focuses mainly on licensing and patenting. They also help the staff at public research organisations to create new companies in order to develop or commercialise an invention (spin-offs). Technology transfer institutions are not only a means to establish, intensify and professionalise the cooperation between public

research organizations and firms but can also contribute to amelioration of communication between SMEs. Technology transfer institutions can function as organizational units or specialized departments within public research organizations, subsidiary organisations working outside of a research institution or public (private) independent intermediaries serving more than one publicly funded research institution (*Technology transfer institutions in Europe* 2004, p.11).

The role of business incubators is to accelerate the successful development of mostly innovative start-up and early-stage companies through business support resources and services. Business incubators deliver surface for the entrepreneurial activities, financial, economic, legal, technological, organizational counseling; they create climate suitable for entrepreneurship and for innovation generation. They often initiate contacts between start-ups and regional R&D institutions that provide an opportunity for new companies to exchange knowledge and to create innovative products and services. A firm can stay in an incubator only for a certain time. After this time the company must give place to other start-ups (Burdecka 2004, p.65).

Local guarantee funds are non-profit banking institutions providing financial services in the form of grants and loans with preferential interest rates for start-ups and financial guarantee for companies that don't meet the requirements to take a bank loan (Dominiak 2009, p.191). Financing new firms at the beginning of their existence, local guarantee funds support business ideas that can be transformed into innovative products, processes or services. As limited access to finance resources is often mentioned by start-ups as a main barrier to innovation, local guarantee funds make possible the implementation of innovative projects into business practice.

4. Institutional support of innovation in Rhône-Alpes

With the population of 6.12 million inhabitants in 2008 (9.6% of total French population), Rhône-Alpes is second best French region in terms of innovation performance after Ile-de-France (Table 1). The regional R&D expenditure was 2.59% of the GDP in 2006 (with 69% of enterprise expenditure and 31% provided by public sector in the region) (*Indicateurs régionaux...*, 2009). Rhône-Alpes is known as a research pole with research performance results (number of patent applications, number of publications) superior to other French and many European regions. As stated by Gallié (2007, p.17-18), Rhône-Alpes has high level of technological competences in nanotechnologies (Grenoble), in biotechnologies (Lyon), in technical textiles. Its entrepreneurial dynamic (including new innovative firms) is of key importance to the region. There are however many actors in Rhône-Alpes and various disparities are being observed. Even if the regional R&D expenditure is relatively high, it doesn't allow to compete with the biggest European regions due to the lack of big companies (91% of regional firms have less than 10 employees). New emphasis is therefore put on research and innovation sector in Rhône-Alpes and other French regions to adapt the regional economies to the needs of international competitiveness and innovation challenges (*Stratégie nationale de recherche et d'innovation* 2009).

Table 1. Rhône-Alpes region - main innovation characteristics

Indicator	Year	Value	National part	National rang
Number of students in higher education establishments	2007	234 610	10.5%	2
GERD (in mln euro)	2006	4536.4	12%	2
R&D expenditure (in % of GDP)	2006	2.59%		3

Human resources in science and technology	2006	41 698	11.5%	2
Number of master diplomas	2007	10 205	10.8%	2
Part of scientific and technological production (in %)	2006	12.9		2
Number of Ph.D. thesis	2007	1 175	11.4%	2
Scientific density to total population (France=100)	2006	136		3
GDP per capita (in mln euro)	2006	29100		2

Source : *Indicateurs régionaux de la Recherche et de l'Innovation. Rhône-Alpes*, Direction de l'évaluation, de la perspective et de la performance, janvier 2009.

Regional innovation system in Rhône-Alpes is characterized by a wide range of structures supporting innovation processes. The aim of this section is to demonstrate the significance of 2 incubators (Crealys and Grenoble Alpes Incubation) and Regional Agency for Development and Innovation (ARDI) for regional innovativeness.

Grenoble Alpes Incubation (GR-A-IN) is one of the first public incubators in France which encourages creation of innovative start-ups. GRAIN was founded in 1999 by the Atomic Energy Commission (CEA), the French National Scientific Research Organisation (CNRS), the National Polytechnical Institute of Grenoble (INPG), Joseph Fourier University (UJF) and Pierre Mendès-France University (UPMF).

GRAIN as a structure searches for and supports innovative projects. These projects must be linked to public research either by the technology directly coming from public research or being closely linked to it. The incubator particularly encourages the creation of new firms with high growth potential. It is hoped that in long time perspective these enterprises will generate new jobs and influence the regional competitiveness. GRAIN has a significant role in technology transfer from public research to new companies: these firms convert new technologies into a competitive advantage for themselves. Since the creation of GRAIN 131 projects have been incubated, 73 start-ups and 334 direct salaried jobs (excluding founders-

associates and trainees) have been created (<http://www.grain-incubation.com>). GRAIN awarded as 2008 Euro leader for the category “Scouting for Knowledge spin-off” by the European Community of Business and Innovation Centres. GRAIN has also been connected to US incubators (California and Boston) and several EU incubators (Jordanov 2009).

Crealy - the second public incubator created in 1999 in Rhône-Alpes – has incubated 224 projects (25 in 2009) and has created 119 start-ups with innovative potential and 700 new jobs approximately which is the best performance of all French public incubators (<http://www.crealys.com>; 1.01.2010). The repartition of new companies by sector of activity shows the predominance of life science (37 % and 42 enterprises created), ICT companies include 31 firms, technological firms – 38, human science – 2 ones. The survival rate of new companies is about 81% for a period of one year (taking into consideration a three year period it is 95% and a five year period – 70%). Annual number of companies created is 13, about 1000 people is encouraged every year by Crealy to create a start-up company.

The role of ARDI – Regional Agency for Development and Innovation – is to contribute to the regional innovativeness by various projects realized not only with French partners, but also with international actors (<http://www.ardi-rhonealpes.fr>). The Agency created in 2008 is composed of 7 departments: health, digital, performance, design centre, synergy network, material, electronic systems which are connected to regional agencies and technological centres that existed independently in Rhône-Alpes before the creation of ARDI. The strategic challenge of the Agency that in 2009 employed 60 employees with the annual budget of 7 mln euros is to detect, assist a firm in the development of the business. ARDI collaborates largely with competitiveness poles, economic clusters and other innovation support institutions in the region such as Oseo; it encourages interactions between research establishments and industry. There exist the following networks created by the ARDI: network of technological counselors in Rhône-Alpes region, environmental network, design network, cold plasma network, Club

Lean network, medical sector network. The Agency's personnel analyses constantly various innovativeness and competitiveness fields in France and all over the globe in order to provide the best solutions and the most appropriate information to regional actors who cooperate with ARDI.

The example of 3 innovation support institutions in Rhône-Alpes has been an attempt to show the involvement of these structures in regional innovation processes by the enhancement of technological capacities, start-ups and network creation on the territory.

5. Conclusions

As stated in the literature (OECD 2006; Gallié 2007; *Stratégie nationale de recherche et d'innovation*, 2009) French innovation system is fragmented and regional actors, entrepreneurs are often not aware of the existence of different measures supporting regional innovativeness. Crossing competences of various institutions make the system even more complicated. Rhône-Alpes is the example of the territory where many actions are being taken to enhance regional innovativeness and to meet the challenge of regional and international competitiveness and where results are visible even if new steps can always be taken to achieve better results. Best practices observed in the functioning of innovation support institutions in this region can serve as the example to be followed by other regions.

Endnotes

¹In the academic literature there exist synonyms to the term of *innovation support institutions*: innovative milieu, innovative environment, innovation system, innovation infrastructure (Dominiak, 2009, p. 190).

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