MODEL OF REGIONAL KNOELEDGE TRANSFER: MAIN ACTORS, FRAMEWORK AND THEORY

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Abstract
This paper analyses potential mechanism of regional knowledge transfer in region with poorly developed innovation infrastructure (the Autonomous Territorial Unit Gagauzia, Republic of Moldova) through interactions between regional major players of the Regional Innovation System - the educational and research institutions, small and medium enterprises (SMEs) and local authorities. Solution of this problem can be found in modern studies of territories innovation development through the clustering processes. Through the empirical study - innovation potential analysis of local SMEs - we proposed advantage mechanism which focused on the one type of knowledge cluster – Innovation and Educational Cluster. The symbiosis of entrepreneurs, government agencies, educational institutions and business service providers with the regional core - University, allows to increasing exchange flows of innovative knowledge between all members of the cluster and distributing them to the entire region and beyond. The results and proposals of this study formed the basis of the "Program of increasing the innovative potential of Gagauz SMEs".

Key words: *Regional development, innovation cluster, endogenous growth, entrepreneurship*

JEL Classification: L26, I25

I. INTRODUCTION

Economic growth in the modern states according to most researchers is provided by the National Innovation System (NIS). The problem of transformation of the existing NIS in developing countries related to the question: what factors can developing countries catch up to develop? Answering this question Gershenkron (1962) noted that a developing country has only one advantage - "advantage of backwardness": the possibility of existing institutions to borrow technologies and management methods. The problem of borrowing easier and less costly than the development of something fundamentally new". How true this statement is? Is it possible to quickly transfer existing practices and methods of innovation development without adaptive mechanism, without preparing the ground for an effective assimilation?

Modern studies have mainly focused on highly urbanized technologically advanced regions, characterized by the institutional infrastructure development, with plenty of high-tech firms and a high level of associating enterprises, high-intensity knowledge sharing and absorptive capacity. Only a small number of empirical researches emphasize the unfavourable for innovative development conditions, characterized by the lack of innovation environment, supporting organizations, and undeveloped networking of regional development (Tödtling, F., M. Trippl, 2005 and Isaksen, 2001). This questions are typical for the "emerging market economies" countries for which Vercueil (2012) proposed the following characteristics: intermediate income (between 10-75% per capita income of the average EU level), catching- up growth (narrowing the income gap in the last 10 years in comparison with developed economies), economic opening and institutional transformations.

Innovation development in such regions is very difficult for a number of reasons: lack of high- tech sectors, which would have the technological complementarities and perform the role of "prime mover" of the regional economy, poorly developed network of interaction between the actors of innovation environment, lack of their critical mass, lack of institutional framework and environment that encourages innovation and technological growth (Isaksen 2001, Todtling and Trippl 2005).

The aim of this article is to answer the question about possibility of developing an innovative system in the peripheral regions with poorly developed industry and innovation infrastructure. The answer to this question can be found in modern studies on territories innovative development through the clustering processes. Creating an innovation network, accelerating the interactive learning process between local actors and their external

partners, territorial knowledge capital growth based on the concept of cognitive economics (Cappellin, 2003). For these reasons, in our study we focus on the one type of knowledge cluster – Innovation and Educational Cluster (IEC), which is actual for the regions with poor developed industry but universities present.

II. THEORETICAL RESEARCH BASE

2.1 Role of interaction between actors of innovation invironment

According to Autio (1998) RIS is composed of two subsystems: knowledge generation and diffusion subsystem; knowledge application and exploitation subsystem. The first involved with four main types of institutions, which are participating in the production and dissemination of both codified and tacit knowledge and technical skills. Key elements include public research institutions, educational institutions, workforce and technology mediating organizations.

Consequently, "RIS covers all actors in a certain region that are involved in the process of Knowledge and innovation creation" (Cantner, Meder and Wal, 2008). Thus, innovation is "the result of a process of collective learning and flexible forms of cooperation between many different private and public, regional and international actors" (Cappelin, 2009). The intensity of the interaction between the actors of the innovation environment determined by the acceleration of the creation, acquisition, accumulation and utilizing knowledge (Zahra and George, 2002) and level of absorptive capacity. Absorptive capacity requires learning capability and develops problem-solving skills; capacity to assimilate and create new knowledge for innovation.

Moreover, there have been defined two different types of absorptive capacity: potential absorptive capacity that is important in acquiring and assimilating external knowledge; realized absorptive capacity refers to the functions of transformation and exploitation of collected knowledge. According to Zahra and George (2000), these types could be theoretically equal, but in most cases, potential capacity is larger than realized because it includes tacit knowledge embodied in individual knowledge innovation networks of actors. Transfer of individual tacit knowledge into corporate codified knowledge and then transformation into external collective network knowledge gives rise to strengthened cognitive relations between members of cluster network (Cappellin, 2006). Cognition of these processes in our opinion rooted in existing inter-firm networks, an adequate system of education for the regional needs and the "stickiness" of knowledge. In the regions with a small potential for innovation and low absorption capacity in the structure of entrepreneurship, dominated small companies with chaotic, based on existing or new combined innovations (Asheim and Coenen 2005). On the other hand innovations can not be developed without the demand from entrepreneurs (Cooke et al 2003), cooperation and technology transfer between public research centers, universities and the private sector (Doloreux 2003). Therefore the University, in our case, plays an important role in the creation of regional innovation development through increased absorptive capacity of regional SMEs.

2.2 Clusters in modern concepts of regional economic policy formation

According to Porter (1998), the concept of clusters represents geographically concentrated companies, firms in related industries, which compete and cooperate with each other, creating a single interaction process. One of his main ideas is the assertion that concentrated geographically and mutually competing groups of companies can be a powerful competitive force in the global economy. Typology of clusters depends on the choice of the key characteristics of the cluster:

- *Clusters of knowledge* - as the concentration of economic activity around the existing knowledge infrastructure (universities, research institutes);
- *Industry production clusters* formed by the enterprises united strategy of vertical integration;
- *Association of enterprises* maintaining common infrastructure, or applying unified technology;
- *Cluster Mixed*, representing a combination of various types of clusters.

The main clusters characteristics are: geographical concentration (fast exchange of production and social resources), specialization (concentration around field of specialization), multiplicity of stakeholders (public organizations, universities, financial intermediaries, research institutes, etc.), achievement of "critical mass" in the cluster size (the effect of the internal dynamics and development), viability of clusters (designed for long term), involvement in the innovation process (organization - participants are included in the processes of technological product, market or organizational innovation).

However, there are critical comments related to Porter's theories. Most important is to focus on difficulties or, sometimes, impossibility to achieve desired concentration of key industries resources in less developed countries. As it is known, well-developed infrastructure is the basis of the clustering processes in the region. Even though the construction of cluster networks is often based on the development "needs" of small peripheral regions, rather than on their "potential" (Edward M. and et., 1999) in relation to lack of adequate infrastructure in the regions.

In order to improve the quality of life in a particular region commercial, non-profit organizations, and government agencies can be combined in a "regional network of innovation economic development". These structures function as a non-profit association which aim is regional development, expressed in the joint development of strategic plans. This is their main difference compared to Industrial clusters, which purpose of creation is to increase production efficiency. Creating this kind of networks is a reaction to the emerging imbalance in the region, the deteriorating economic situation, growth of immigration processes. Depending on the base of occurrence, clusters can be natural or artificially created.

The role of the state in the first case is of a cluster network participant, while in the second case – of the initiator, which defines goals, objectives choosing the main actors for the network. According to a study of the European Cluster Observatory in 2012, the cluster initiator in 39% cases is a private sector, in 36% - public authorities. The presence of a university in the study region gives grounds to initiate the process of starting the endogenous growth mechanism of the innovative regional development. For this purpose turn to the existing theories as a type of knowledge and mixed clusters can be based on the Triple Helix model proposed by Etzkowitz (1995). It brings together the central players responsibility for the development of innovative regional space: education, government and business. This model represents close cooperation between these three elements in relation to the development of innovative projects that are simultaneously acted on as an independent agency (Fig. 2a). More extended model was presented by Sölvell (Sölvell, 2008) and includes representation of government agencies, financial, educational and research systems; business services providers and entrepreneurship (Fig. 2b). It is worth noting an interesting element that is specific only for this model - channels of cluster initiatives promotion.

As a result of the participant's interaction in the cluster a synergy effect appears that is a source of growth in the cluster. Savings arising in connection with the expansion of access to different resources, development of various forms of outsourcing (including R&D, if the cluster includes public and private research structures), facilitating entry into the chain costs and network of creation of products and technologies, economies of transformational and transactional expenses, general management and staff training. These processes depend on: the level of integration and coordination among the members of the cluster organizations; availability of transactional relationships; absorption rate - as "set of organizational capabilities which firms acquire, assimilate, transform, and exploit outside knowledge to produce a dynamic capability" (Zahra, George, 2002); ability to create new knowledge and the speed of their implementation; desire and understanding of the cooperation benefits. These processes based on the different forms of proximity reflected in our model of (IEC).

III. EMPIRICAL RESEARCH BASE

3.1 Barriers of implementation innovations processes in SMEs

SMEs in RM have an important role in generating economic growth during the transition from centralized type of economy to market oriented economy. Entrepreneurial sector consists of up to 98% SMEs, of which 76% are microenterprises, which contribute to new job creation, support innovation and stimulate competition. Economic potential of the autonomy is determined, above all, by its agro-industrial complex, relying on local natural conditions and the centuries-old skills of the population in agriculture and food production. Industrial production in Gagauzia constitutes a small fraction in comparison with other regions, but the export volumes indicators are comparable to the average level in the republic.

Table 1. Prevention factors for the science and business cooperation in innovation

Importance	Prevention factors for the science and business cooperation in innovation	Mean rank
1.	Passivity of the authorities in support of cooperation	4.62
2.	High risk of RDI	4.21
3.	Insecurity of property rights	3.89
4.	Lack of information among SMEs about RDI possibilities	3.85
5.	Weak demand from business on innovation	3.74

Source: own calculations.

A high rate of exports (57.9%) related with increasing of the share of innovative products in the region. Table 1 illustrates the share of innovative products sales of regional SMEs, which in more than one third of enterprises varies within 5-10%. The analysis of respondents' answers to the question about the form of innovations in enterprises shows that in most cases it is discovery and non-patent invention - 45%, rationalization proposals - 30% and trademarks, brands - 20%, as well as documents describing the new management and processes - 16%. Analysis of responses to the question about types of innovations implemented

in the company shows a high percentage of products and technological innovation, which is explained, in our opinion, by the traditional view on innovation, as radical innovations. Insignificant level of implementation of marketing and financial innovation can also be explained by the absence of knowledge in this area of business leaders. Answers to the questions about prevention factors of science and business cooperation in innovation allow us to detail the SMEs problems in the field of cooperation.

The previously mentioned problem of lack levers of state influences the development of innovative SMEs activity in the context of financial problems. In addition to this, one can mention the reasons and low level of interaction between structures, and as a result - lack of confidence, lack of knowledge about the forms and methods of research collaboration (Tables 1-3).

Table 2. Internal reasons preventing innovative SMEs activity

Importance	Internal reasons preventing of innovative SMEs activity	Mean rank
1.	Lack of qualified HR	4.41
2.	Difficulties finding investments	4.32
3.	Poor systems stimulating RDI activity	4.27
4.	Lack of own financial resources	4.24
5.	Undeveloped relationships with universities, R&D instit., etc.	4.07

Source: own calculations.

This fact requires the activation of state support in the field of protection of intellectual property rights for innovative products. Isolation, insulation in the field of research leads to ignorance with regard to the latest advances in scientific and technological progress, the results of research in the country. As a result - a waste of resources on the development of already existing innovative products or spending funds for invention without further demand on the market.

Table 3. External reasons preventing innovative SMEs activity

Importance	External reasons preventing innovative SMEs activity	Mean rank
1.	Insufficient favourable conditions of financing	4.39
2.	Administrative barriers, corruption	4.34
3.	Risk of return on investments for innovations	4.27
4.	Weak incentives: taxes, depreciation, customs fees, etc.	4.17
5.	Imperfection of legal regulatory documents (National level)	3.94

Source: own calculations.

Most internal reasons relate to the lack of own or borrowed SMEs funds. However, there is a new factor, significantly hampering the development of innovation - lack of skilled, innovative-minded staff. If 15 years ago one of the strong points of the region under SWOT analysis - noted "the presence of highly qualified personnel". Now there is a serious deficit of highly qualified personnel. According to data provided by the International Organization for Migration up to 40% of the population of RM aged 16 to 60 went abroad.

3.2 Policy directions of increasing innovation potential of SMEs

Regional Strategy of socio- economic development of Gagauzia, law about SMEs Support and relevant policy documentation in each of the Moldovans regions highlights that entrepreneurship are critical to improving regional performance. The Council for Innovation Development in Gagauzia is the body that since 2013 determines the innovation policy of the region in the framework of the Innovation and Educational Cluster (IEC) which unites educational organizations, business service providers and innovation entrepreneurs. The R&D potential of Gagauzia is rather limited due to the size and lack of scientific base of the region.

Analysis of SMEs opinions on the expected support from the regional administration confirms the need for any form of *financial support*:

- Subsidies for reimbursement of costs; tax exemptions; assistance in conducting scientific research; insurance of SMEs commercial risks.

But in addition to these factors there was highlighted the need to consider the *group of organizational factors*, which include:

- Assistance in conducting scientific, marketing research; methodological and organizational support in SMEs innovation development; help in establishing contacts between innovators inside and outside the region.

The elimination of these problems shall allow the development of appropriate educational programs, strengthening information support; promote integration and exchange of experience with leading innovative companies. Results of this study are reflected in the recommendations on the construction mechanism for launching innovative potential of SMEs for local authority. A critical role in the development of cluster policy belongs to the state, which should minimize interference restricting the competition and, on the contrary, shall play the role of an activist in areas such as business environment (reducing "barriers to entry"), infrastructure, and encouraging innovation at the legislative level. Organizations cluster benefits due to synergetic effect are obvious.

The symbiosis of entrepreneurs, government agencies, educational institutions and business service providers in the region with the core - regional based University allows to establish exchange flows of innovative information, inventions and technologies between all members of the cluster and further distribute them to the entire region and beyond. This kind of innovation network allows all key actors to exchange existing information, knowledge and expertise (Cantner, Graf, 2011). The purpose of the study is to show the impact of IEC promotion innovation activities on increasing regional entrepreneur's innovation potential with focus on the determinants of relational interaction.

IV. ROLE OF CLUSTERING PROCESSES

In case of absence of high- tech companies in the Gagauz region, educational institutions, universities and research structures should assume the flagship role in the development and diffusion of innovation. Universities located in the peripheral regions (North and South) of the RM can act as "growth poles" of innovation activity. The concept of "growth pole" was introduced into the scientific circulation in the early 50's by Peru. According to his idea economic growth is everywhere and has a focal character. Regional innovation cluster in our case can be defined as geographically innovative concentrated organization, which, through interaction as the driving forces determine the vector of regional innovation. Empirical studies show that firms located near knowledge sources promote the growth of innovative activity more than firms located elsewhere (Boschma 2005).

Cooperation also includes: implementation of joint research programs and projects for the creation and development of technologies; formation of temporary joint research teams, laboratories, as well as innovative companies and organizations to ensure the development of new techniques and technologies; development and coordination of training programs in the field of management and promotion of innovation; joint seminars, scientific conferences and other business meetings; attract investment to finance joint projects; training of scientists and specialists. Innovation and Education Cluster (IEC) acts as a "Knowledge transfer channel" (Sorenson 2003) and "filter for external knowledge and information flows as an important sources of innovation development (Rodrıguez-Pose and Crescenzi 2008). Selecting relevant information for members of the cluster, coding and adapting it to the level of basic knowledge of the recipient, IEC contributes to the increasing of the level of absorption capacity, rapid transfer and assimilation (Fig. 4). The main clusters function is to identify the value of information, encode it, train the future recipients for increasing level of their absorption capacity, and establishing diffusion processes.

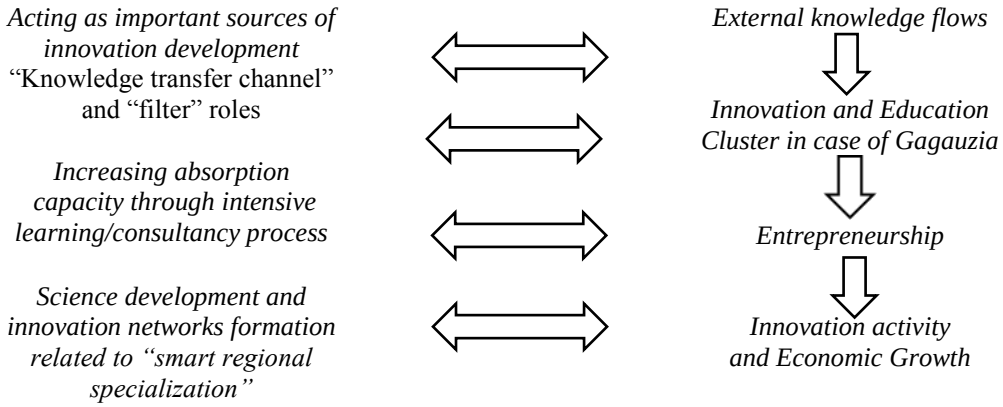

Figure 3 - "Knowledge Transfer and Filter model" as an instrument of increasing SMEs innovation activity

Source: own construction

The geographical proximity of firms is a necessary but not sufficient condition for the unique stimulation of innovation and cluster growth. It is very important to establish a mechanism for the exchange and feedback

between the various actors and stakeholders: local and regional authorities, Educational organizations, Business service providers, financial organisations. RIS is fragmented and consists of actors, not connected among them, but from 2012 IEC brings together key stakeholders in the region from the areas of education, science, business and regional authorities.

V. CONCLUSIONS

Organizations benefits of joining the cluster due to synergistic effect are obvious. Symbiosis entrepreneurs, government agencies, educational institutions and business service providers in the region with the core – Comrat State University (CSU) allows to establish exchange flows of innovative information, inventions and finished products and technologies between all the structures of the cluster and further distribute them to the whole region and beyond (Levitskaia, 2013). The following main challenges facing the IEC shall be considered:

1. Creating a unified informational and educational environment between members of IOC: creation of resource centres, the development of science and innovation (the development of doctoral studies), assistance in obtaining patents and registration of innovative technologies.
2. Forming an IEC partnership strategy with commercial, non-profit and governmental structures: prediction of demand for professional staff, development of research projects with business representatives, modernization of laboratories, and training of professionals.
3. Integration into the world educational space: the organization of internships in foreign universities and enterprises, conducting and participating in conferences, competitions, contests, projects, etc., implementation of "double degrees" programs.

Studies of the "economic miracle" shows that developing countries were carrying out the modernization by borrowing technology from advanced countries. In the post - Soviet countries transition to own way of innovative development happens gradually, borrowing period can be sufficiently longer than planned. Strengths of education and scientific potential must be involved in the process of constructing the internal regional growth. Therefore, exactly the modernization of education process and creation the structures of knowledge transfer around the educational institutions should be the cornerstone of the innovation regional development.

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