

NATIONAL AND FOREIGN INTEGRATION EXPERIENCE BETWEEN SCIENTIFIC AND INDUSTRIAL SPHERES OF ACTIVITY

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1. Introduction

Contemporary, lop-sided development within territories is a common feature of the regional development among various world countries. Herewith the given feature has not only respect to Ukraine, and also to a number of developed countries, which take leading position with regards to social and economic development. As a general rule, regions which are about high level of scientific, technical, education and innovation capacity have more influence with economic development of the country. Those regions may be defined as “Territories of innovation development”.

Under the analysis of innovation policy of world countries some authors emphasize strongly marked direction to the integration between R&D sphere and production industry [1]. Namely L. Fedulova and M. Pashuta emphasize role of innovative system under the innovative development together with state innovative policy concepts and governmental measures in the context of national innovation system [2]. In such a case regional regulatory body for the most part act as an intermediary between R&D sphere, universities and manufacturing businesses. With this end in view a demand arose for creation of distinct structures, such as namely cooperation centres, interdisciplinary centres, transfer points for innovation technology diffusion, commercialization centres.

2. Materials and methods

In the age of globalization and rapid increase of scientific-technological progress capacity to generate and implement innovation research work into industrial production may be considered as the main factor of region competitive ability.

Among EU countries there are such priority missions as high-tech industry development and innovative extension of service sector.

In connection with the mentioned tasks there has been developed peculiar program RITTS (Regional Innovation and Technology Transfer Strategies and Infrastructures Project) inside EU countries. RITTS is program of development for regional strategies and infrastructures within technology transfer and innovative activity. Each EU country has its particular approach of innovation system development in the regions, which takes into account allocation of research and education establishment, manufacturing businesses.

3. Statement of the problem

Ukraine has been traditionally considered as a country of significant scientific potential acknowledged worldwide having various academic institutions and staff training systems. At the same time current development model for the industrial sector of Ukraine which tends to traditional technology of production engineering and export orientation may lead to the further technological inferiority comparing to developed countries and deterioration of the national competitiveness.

In such a manner one may indicate priority task of the state policy at the present stage to make

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arrangements for balancing all subsystems of national innovation system, which are as follows – innovative business support at all levels, demand stimulation for R&D results and competent personnel, arrangement of favorable conditions for innovation production with a high level of added value.

4. Research proposal

Trend analysis in innovative activities of Ukrainian industrial sector for 2008–2012 indicates slow dynamics for the numerous directions, table 1. Thus innovative activities in Ukraine is marked by slow rates of growth for the quantity of innovatively active businesses which are as follows: the number of enterprises has increased in 2012 grown up to 14,1% compared with 2008 and percentage of innovative products among the whole amount of products sold has decreased from 6,7% in 2008 to 3,8% in 2012.

Tab. 1. Trend analysis in innovative activities of Ukrainian industrial sector

Criteria	2008	2009	2010	2011	2012
Total size of financing for the innovative activities in Ukraine, billion, grn.	10,8	12,0	7,9	8,0	14,3
Number of innovatively active manufacturing enterprises / % of the total number of manufacturing enterprises	1472/14,2	1397/13,0	1411/12,8	1462/13,8	1679/16,2
Innovative production assimilation at the manufacturing enterprises, items	2526	2446	2685	2408	3238
Amount of innovative products sold, billion grn / among the whole amount of products sold	40,2/6,7	45,8/5,9	31,4/4,8	33,7/3,8	42,4/3,8

Under all conditions of economic development there is important factor of private business and state cooperation which arises in form of innovation management on behalf of central and regional state authorities. Global experience shows that one of the determinative factors of effective state policy with regards to innovation structures is innovation implementation within state administration bodies. In such manner, analytic report database of European Commission PRO INNO EUROPE “Innobarometer-2010” (which is focused on governmental innovations) shows that 88,5% of state authorities in European countries implemented either new or renewed services during 2008–2010. Among them there are 90% of Spain authorities, 89% of Netherlands authorities, 76% of Great Britain authorities [3]. In effect electronic government mechanisms together with on-line services may significantly strengthen cooperation relations between business and science and government, simplifying interactions while removing bureaucratic obstacles on the way to the development of entrepreneurship and network structures in technological regions.

Research intensity of economics has achieved 2,0% in 27 European countries in 2011. Correspondingly R&D intensity of Ukraine compiled 0,73% in 2011, which is equal to Croatia item and exceeded correspondingly Slovakia, Malta, Latvia, Cyprus and Romania levels recorded in 2010.

European countries’ personnel involved in R&D composed of 2,5 million people in 2011. Namely half of them (1,3 million) were acting in business sector of economy. In Ukraine R&D personnel composition contained 47% employees involved in business sector, 44,8% involved in state sector and 8,2% involved in higher education sector in 2011.

Latterly there is a deep gap between manufacturing, science and education and consequently low efficiency of technological exchange in Ukraine. In Ukraine suppliers of equipment, raw materials and software support (which are about 17,1% all together) and also clients or customers (9,9%) become the most important partners of innovative businesses cooperation. In addition state government institutions are least of all involved into cooperation. Moreover the relations between government and education sectors appear to be weak and small in importance.

Evidently it is possible to indicate anti-growth factors which block achievement of innovativeness.

Various factors prevented implementation of innovations during the long time. Tab. 2 contains grouping of factors for the further effect estimation with regards to innovative activities during three years which have been provided by the enterprises.

Tab. 2. Enterprise assignment according to the most significant anti-growth factors, which prevented implementation of innovation (% percentage among the total amount of innovation)

Anti-growth factors which prevent implementation of innovation activities		Innovation enterprise	Non-innovation enterprise
1. Price factors	Lack of funds inside the enterprise	7,8	16,3
	Lack of funds outside the enterprise	4,6	8,7
	Big expenses needed for innovation activities	6,2	12,0
2. Information	Lack of competent personnel	1,5	3,4
	Lack of technologies' data	1,0	2,1
	Lack of markets' data	0,8	1,9
	Troubles with finding the partners to organize innovation activities	2,4	5,3
3. Markets	Some enterprise dominate at the market	3,9	7,1
	Small demand for innovative goods and services	1,9	4,2
4. Reasons of innovative passivity	No need with reference to the previous innovative activities at the enterprise	1,1	2,0
	No demand for innovations	1,8	5,7

Growth of innovative activities may only be possible under implementation of newly developed management tools, which stimulate efficiency improving through the following effects:

- production of higher value added products;
- development of high-tech and knowledge-intensive manufacturing;
- creation of closed manufacturing loops.

In such manner one of the most efficient measures for the stimulation of innovative activities in area of industry may take the form of cluster approach which allows joining the resources and competences not available for a single enterprise.

From the other hand cluster structuring in world developed countries is the common tendency of innovation policy. Consequently adequate degree of scientific and education sectors may contribute to innovative territories formation on the base of R&D complexes and scientific institutions and compose in that way innovation clusters. Innovation cluster in that context may be determined as a composite of independent enterprises, which are the following: scientific establishments; universities; knowledge-intensive business; coordinating companies between science and manufacturing; consulting firms and also the customers [4, p.30].

By the reference to universities as a part of cluster allows the region to gain competitive advantages while simultaneous investing into real sectors of economy, education and R&D development. Innovative directivity therefore becomes an important distinguishing feature of such cluster.

Mechanisms of cluster policy increasing innovation potential are rapidly used in various developed world countries. That is to say cluster policy is an integrate part of national development strategies in such leading innovative European countries as Germany, Denmark, Norway and Finland [5].

In certain regions of France, (which are to be called provinces and departments) innovative development takes various forms of science parks and hi-tech complexes. In the same time such

phenomena exist over the whole area including regions of mono-producing orientation, where high tech manufacturing covers less than 2–3% of GDP. Great Britain in section of innovation management is traditionally represented with universities and polytechnic institutions, governmental R&D centers and applied research laboratories. 22 science parks have been created on the base of 20 universities in Finland through municipal authorities' initiatives [6, p.25].

Compared together Ukrainian and European experience in innovative activities it can be expected that Ukrainian innovation clusters are mostly oriented to traditional industry sectors such as consumer industry, construction, agriculture, metallurgy while European innovation priorities are primarily focused on high technological clusters in area of machinery manufacturing, bio-pharmaceutics, and electronics.

At the same time there are all favorable requisite for innovation clusters' development within high technological sectors in Ukraine. The common background of technopolis and industrial parks is represented with the following areas:

- Scientific park “Kyiv Polytechnics” where bio technologies and application-specific system are regularly applied;
- Technopolis “Pyatichatki”, specialized on nuclear technologies, Kharkiv city;
- “Rozivka” center, specialized on electronic industry, Transcarpathian region;
- Industrial Park “Solomon” specialized on automobile manufacturing, Transcarpathian region.

Still there is significant obstacle under the state policy of Ukraine regarding financing and sponsorship support. Development of innovation clusters based on Technopolis ground is need of increasing direct state financing of technoparks, industrial parks and business incubators on the model of European countries. Specifically percentage of government expenditures for technoparks' financing averages up to 62% in Great Britain, correspondingly 74% in France, 78% in Germany, 70% in Netherlands and almost 100% in Belgium [7, p.10].

Greatest tendency of innovation policy in European countries may be indicated in well defined role of the state government functioning with regards to innovative territories' creation and further development. The governments are actively using administrative and economic measures, federal financing and subsidy assistance for R&D functioning.

As can be seen from the above the group of administrative measures should contain the following items:

- focus on education and science sphere as leading priorities in frame of innovative development of the region;
- regular federal financing of basic and applied research;
- preferential taxation;
- procurement of venture capital.

Correspondingly the group of economic measures should contain the following items:

- intellectual property protection and patent system upgrading;
- promotion of scientific personnel mobility;
- innovative orientation of R&D projects;
- stimulation of integration between R&D and manufacturing enterprises inside innovative system;
- individual encouragement of scientists to participate and develop innovative activities.

The fact is there are only single elements of innovative infrastructure functioning in Ukraine. In other words the heavy obstacle prevents creation of national innovative system which would be adequate to the market needs and enable to fix the closed innovative cycle – from the creation of innovation till the final implementation. In the same time there are over 12 technoparks, 20 innovation centers, 24 innovation business incubators, 11 centers of intellectual property commercialization, 15 scientific & technological information centers in Ukraine [8].

4. Conclusions

Summing up the research results one may see the foreign experience represents that contemporary high technological production may develop entirely in the context of integration between R&D and manufacturing businesses inside of cluster structures. The government policy in Ukraine should be focused on cluster development, including favourable macroeconomic, information and legal conditions which initially contribute to business development and growth. From the other hand European state practice shows the necessity to build a reliable information base for the cluster development. It also emphasizes great importance of integrating efforts of the government, private sector and public organization to achieve the goal of efficient clustering.

The given analyses of integration of R&D and manufacturing enterprises in foreign countries becomes extraordinary factor of prime importance for Ukraine. It may be considered as the rational way to achieve competitive capability at the world market and solve various social and economic problems.

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Summary

The article considers issues regarding social and economic development under the innovation aspects of state functioning. The analytic review of integration in cluster systems of foreign and national experience is given. Role of the state in the mentioned processes is substantiated and levers of state power are determined. State support and encouragement factors for the innovation development are emphasized.

Key words: integration, globalization, innovative activities, economic development, cluster system, growth.

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