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Innovation Systems in the Small Entrepreneurship Economic Development in Russian Regions

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Abstract— **Innovations, alongside with the accumulation of physical and human capital, are known to be a universally recognized factor of economic growth. This article is devoted to a study of the innovation system role in the economic development of small entrepreneurship at the regional level. The main goal is to analyze the impact of innovation systems on the development of small entrepreneurship in Russian regions. To achieve this goal, the author applies a correlation analysis that allows identification of a positive interrelation between a number of indicators, characterizing innovation systems and economic development of small entrepreneurship in regions. Also, indicators, which do not play a critical role in the small entrepreneurship development, have been revealed. As a result of this analysis, recommendations on the implementation of measures, related to the small entrepreneurship and innovations, have been issued.**

Keywords— innovation systems, economic development, small business, region.

1. Introduction

The future of the economy of any country cannot be imagined without a wide use of innovations, which ensure sustainable development of socio-economic systems. Thus, innovations, alongside with the accumulation of material and intellectual capital, have become a universally recognized factor of economic growth.

Despite certain advances in the innovation activity in recent years, Russia's economy is still oriented to the export of natural resources. Deterioration of Russia's stable foreign economic relations with various states, which led to sanctions and counter-sanctions, and the fall in oil prices, which affected the ruble exchange rate, have decreased the ability to purchase foreign high-tech equipment and make cross-border transfers of innovative technologies.

The small entrepreneurship also plays a specific role in the country's national economy development. In the developed economies, for example, in the EU countries, US and Japan, the small entrepreneurship share accounts for about 60% of GDP. In Russia, the small entrepreneurship sector accounts for 21% of GDP. The small entrepreneurship not only contributes to the GDP growth, but also plays a socially important role through creation of new jobs, increased competitiveness of regional economies and the national economy as a whole, and the implementation of innovative technologies. The activity of today's small enterprises is largely focused on the creation of innovative products, and the investments of the Russian small businesses in research and development are close to the size of investments of large enterprises.

2. Relevance

Thus, the issues of implementing innovations in Russia by the small business are critical and, consequently, the study of those factors, which may impact the development of the small entrepreneurship's innovative activities in the region in the medium and long-term prospective, is expedient.

3. Statement of the Problem

General issues of the innovative development of the small entrepreneurship and innovative small businesses were reflected in studies conducted by Z.J. Acs, D.L. Birch, C. Brown, A. Coad, P. Davidsson, S.-O. Daunfeldt, J. Hamilton, G.I. Bryalina, T.I. Kolodnya, Yu.A. Polunin, M.Totina, etc. Issues related to the state support of innovative small entrepreneurship have been analyzed by V.V. Aleshchenko, V.G. Basarova, A. Vilensky, N.N. Dumnaya, M. Podshivalova, N.V. Klochkova, A.P. Vostrovoy and other Russian scientists. Despite a detailed study of issues related to the small entrepreneurship innovative development features, made by the above mentioned scientists, it's still necessary to identify and evaluate the significance of factors, influencing innovative development of small businesses.

4. Theoretical Background

At the present stage of Russia's economic development, a complex of small fast-growing technological companies is being formed, which ensure the production of high-tech commercial products. Original scientific and technical ideas, a skilled team of developers and designers, high quality of customer-tailored products were the main factors of success of these companies. This success was associated with the launch of new types of goods as well as with the development and implementation of advanced technological developments. Companies, earning profit by providing unique services and operating in new markets, which they won through the implementation of marketing or organizational innovations, are the other type of promising and profitable small enterprises.

There are also factors, negatively affecting the innovative development of the small business, such as the inability to obtain loans under convenient terms, the difficulty of bringing new products to the market, and high competitiveness. The small entrepreneurship is generally suggested to use own funds as a source of financing, since high risks complicate the attraction of investors.

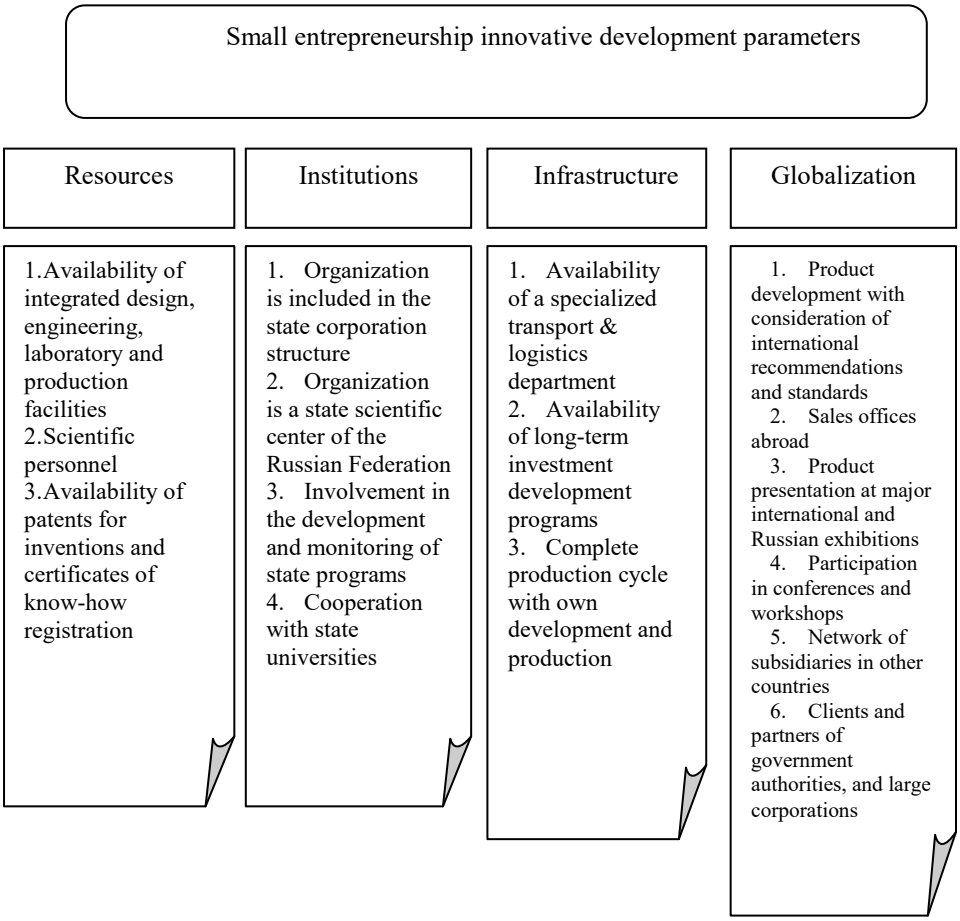

Fig.1 Small entrepreneurship innovative development parameters

The small entrepreneurship innovative development parameters are divided into four groups: resources, institutions, infrastructure and globalization (see Fig. 1).

Recently, shaping the consumer's demand for new products by searching for new market niches is becoming the main feature of innovative development of the small business. Basic innovative development factors used by small entrepreneurs in their activities include resource, technological and marketing factors. Resource factors include government funding, state support through award of state orders, investment and venture support, scientific personnel, information support, and interaction with an innovative regional infrastructure. Technological factors include the creation of new unique products or technologies, innovative ideas and approaches to solving arising problem, improvement and upgrade of innovative technologies. Marketing factors include the formation of a new market niche. To implement these factors, a professional team of employees is needed.

The interrelation between the innovation system and small entrepreneurship is presented in Fig. 2.

However, current conditions of the Russian economy of innovation systems are most likely characterized by a negative development trend and a negative level of activity of small businesses in the innovations area. This is explained by the imbalance in the development of basic innovation potential elements as well as a rather low quality and number of innovation infrastructure subjects.

For a comprehensive understanding of the small business role and place in the regional innovation system and of the impact of small business and innovative development on the regional economy, it's expedient to make a quantitative measurement of the interrelations under consideration.

To measure the dependency between the innovation development and small business activities, the following indicators are suggested to be used:

- Number of personnel engaged in research and development (NOP), measured as the number of employees involved in scientific developments in the region;
- Number of personal computers with access to the Internet per 100 employees (PCI);
- Organizations, which use electronic document management systems (ED). This indicator is measured as a percentage of the total number of organizations in the region;
- Internal current costs of R&D (NIRS), measured in million rubles;

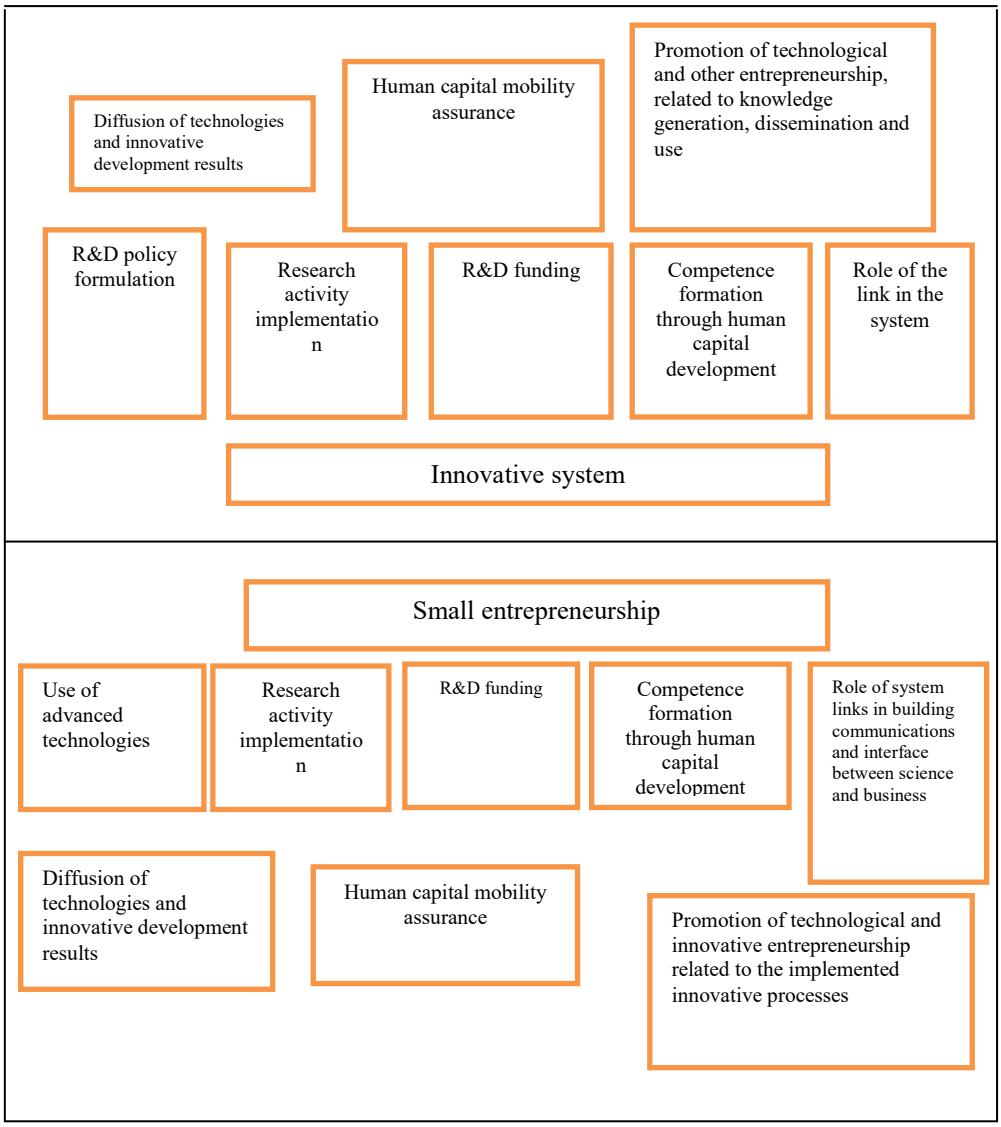

Fig. 2 Interrelation between innovation system and small entrepreneurship

- Issue of patents for inventions in Russia (VPI), measured as the total number of patents issued in the corresponding region;
- Applied advanced production technologies (TU), measured as the total number of these technologies;
- Technological innovation costs (TIC), measured in million rubles;
- Scope of innovative goods, works, services (IGR), measured in million rubles.

The quantitative indicators considered herein characterize individual indicators of the regional innovation system, which allows us to assume that all of them are somehow interconnected with each other.

The below mentioned aggregated indicators were selected as the defining indicators of the regional development of the small entrepreneurship:

- Gross regional product (GRP), measured in rubles;
- Revenues from the sale of goods (works, services) of small enterprises (RSGSE), measured in billion rubles.

In future, it is necessary to analyze mutual impact of regional innovation systems and small business development, and identify their role in the regional economic development.

An econometric analysis of the objects under study will make it possible to verify axiomatically assumed positive links between innovation systems, small business and economic characteristics of Russian regions from the standpoint of statistical significance.

Results of the calculation of corresponding correlation estimates between the indicators, characterizing innovative development of the regional small business as well as between these indicators and regional economy operation indicators are presented in Table 1.

TABLE 1. Estimate of pair correlation coefficients between innovation system, small business and regional economic indicators

	RSGSET	GRP	IGR	TIC	TU	NIRC	VPI	PCI	ED	NOP
RSGSET	1.0000									
GRP	0.9057	1.0000								
IGR	0.8798	0.8614	1.0000							
TIC	0.8165	0.8589	0.8914	1.0000						
TU	0.7498	0.7544	0.8245	0.8780	1.0000					
NIRC	0.9550	0.9040	0.9000	0.8620	0.7769	1.0000				
VPI	0.9548	0.9211	0.9155	0.8112	0.7184	0.9606	1.0000			
PCI	0.6628	0.6043	0.5770	0.5194	0.3397	0.6481	0.6700	1.0000		
ED	0.1274	0.1031	0.1491	0.0593	0.1097	0.1135	0.1279	0.2511	1.0000	
NOP	0.9591	0.9059	0.9026	0.8588	0.7792	0.9979	0.9672	0.6522	0.1083	1.0000

The correlation analysis data presented herein suggest the following:

- Indicators, characterizing innovative development of the small entrepreneurship, are statistically significant with each other. Virtually all parameters have revealed a direct strong dependence, which demostrates a high role of the small businesses in the regional economy;
- The indicator "Number of personal computers with access to the Internet per 100 employees" (PCI) showed an average statistical dependence with all the indicators under review. We also found a weak statistical relationship with the indicator "Organizations, which use electronic document management systems" (ED). This fact may allow us to assume that this indicator is not connected with the innovation system of small business development in the country's regions.

Based on our study, the following main conclusions may be made:

- A statistically significant mutual correlation dependency between the indicators of small business innovative development has been compiled. In addition, these groups of indicators are associated with the gross regional product indicators.
- A cause-and-effect relationship between the indicators of the innovation system and regional small business development has been identified.

5. CONCLUSIONS

The analysis conducted has established and proved very important dependencies, which should be developed and maintained in future. Thus, further studies on the innovation-driven development of small entrepreneurship in regions are required. For this purpose, the following set of measures is suggested:

- Stimulate fundamental and applied studies, including support of and orders from the small business;
- Develop entrepreneurial competencies and motivate the small business entrepreneurship by establishing start-ups, small innovative enterprises and business incubators, providing consulting services;
- Commercialize scientific and innovative developments and bring new products to the market.

Only proper mutual interaction of all elements of the innovation system and small entrepreneurship development may facilitate effective development of regions.

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