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Systemic Approach to Business Administration of Innovation-Oriented Enterprise

Olga S. Mysova¹, Galina P. Dovlatyan², Irina P. Belikova³, Tatiana N. Kostyuchenko⁴ and Maria Troyanskaya⁵

Abstract:

The authors use the method of regression analysis, with the help of which they determine the dependence of the level and rates of economic growth of modern economic systems on development of innovation-oriented entrepreneurship. The additional methodological instrumentarium includes the proprietary method of evaluation of effectiveness of business administration of innovation-oriented enterprise.

The authors offer a systemic approach to business administration of innovation-oriented enterprise and prove its high effectiveness as compared to the usual approach by the example of modern Russian innovation-oriented enterprises.

Key words: *business administration, innovation-oriented enterprise, innovation-oriented economy.*

¹ Olga S. Mysova, PhD in economics, Associate Professor, Don State Technical University, Institute of Service and Business (branch) DSTU in Shakhty, Rostov Oblast, Russian Federation, 346500, 147Shevchenko St., Shakhty, Rostov Oblast, Russia; eliseewa.olga@mail.ru

² Galina P. Dovlatyan, PhD in economics, Associate Professor, Platov South-Russian State Polytechnic University (NPI), 132 Prosvecheniya St., Novocherkassk, Rostov Oblast, 346428, Russian Federation; dovlatyan79@mail.ru

³ Irina P. Belikova, Professor, Department of Management, Stavropol State Agrarian University, Stavropol, Russian Federation

⁴ Stavropol State Agrarian University

⁵ Orenburg State University, Orenburg, Russian Federation

Introduction

Innovations, as a driving force of scientific and technical progress and one of the key factors of competitiveness of national economy, became popular in the whole world. Importance of innovations is emphasized at the highest level, and various countries compete for the right to be considered the most innovational.

The concept of innovation-oriented enterprise economy was created, in which the sphere of science and education is developed, high added value in real sector (industry) is provided, high effectiveness of tertiary sector (service sphere) is provided, high labor efficiency in economy is observed, etc.

The key role in the process of formation and development of innovation-oriented enterprise economy belongs to innovation-oriented enterprise and entrepreneurship. It's a type of business activities of which are dominated by manufacture of innovational products. For that, it requires flexible organizational structure, favorable climate for creative activities, high qualification, creative thinking of employees, etc.

At present, due to lack of specific approaches to business administration, management of innovation-oriented enterprises is conducted on the basis of the usual approach that is used in traditional enterprise. Taking into account the specifics of innovational activities, it is possible to suppose that such approach cannot ensure high effectiveness of management. Thus, topicality of development of new approach, adapted to conditions of functioning of innovational sphere, grows.

This article offers a hypothesis that innovation-oriented entrepreneurship stimulates economic growth and development of modern economic systems. The purpose of the work is to verify the offered hypothesis and to develop highly-effective systemic approach to business administration of innovation-oriented enterprise.

Materials and methods

Theoretical and methodological foundations of business administration of modern enterprise with distinguishing various approaches and methods, structural & functional links, and centers of management are set in fundamental research of such authors as (Hudson, 2015), (Gumerova *et al.*, 2015), (Popkova *et al.*, 2015), (Clermont *et al.*, 2015), (Jacková, 2016), (Parris *et al.*, 2016), (Li and Ma, 2015), etc.

Specifics of activities of innovation-oriented enterprises, theoretical models of their management and results of empirical study of innovational entrepreneurial activities are given in multiple works by such scientists as (Zhang *et al.*, 2013), (Kravets *et al.*, 2014), (Stock *et al.*, 2013), (Dzhandzhugazova *et al.*, 2015), (Eryilmaz and Bektas, 2015), (Herrera, 2016), (Pilav-Velić and Marjanovic, O, 2016).

Based on the performed literature review, it is possible to conclude that despite high level of elaboration of separate aspects of the studied problem, it remains poorly researched. In particular, the connection between innovation-oriented entrepreneurship and economic growth and development of modern economic system is not yet fully studied, and there are no special approaches to business administration of innovation-oriented enterprise.

In order to verify the offered hypothesis, the authors of this article use the method of regression analysis, which helps to determine the dependence of the level and rates of economic growth of modern economic systems (y) on development of innovation-oriented entrepreneurship (x). This method supposes compiling the model of paired linear regression of the type $y=ax+b$, in which values of coefficients “a” and “b” are marked by the computer program (in this work - Microsoft Excel).

Additional instrumentarium of this work includes the proprietary method of evaluation of business administration effectiveness of innovation-oriented enterprise, which supposes the use of the following formula:

$$EBAi/e=SI/LR \quad (1)$$

where

EBAi/e – indicator of effectiveness of business administration of innovation-oriented enterprise;

SI – share of innovational products in the total structure of production;

LR – level of risk of entrepreneurial activities.

As is seen from formula (1), the offered method supposes evaluation of effectiveness of business administration of innovation-oriented enterprise by finding the ration of innovational activity of enterprise to risk component of business, as the most important result of activities of innovation-oriented enterprise is manufacture of innovational products, which is achieved by means of taking certain risk.

The larger the share of innovational products in the total structure of production and the smaller the risk level of entrepreneurial activities, the more effective the process of business administration of innovation-oriented enterprise. These indicators are measures in unit fractions, and indicator of effectiveness – in points.

Results

The data for regression analysis and determination of dependence of level and rates of economic growth of modern economic systems on development of innovation-oriented entrepreneurship is given in Table 1.

Table 1. Dynamics of GDP and share of innovation-oriented entrepreneurship (SIP) in the structure of economies, 2012-2015

Country	Indicator	Values of indicators for the years				
		2010	2011	2012	2013	2014
Austria	GDP, \$ billion	354.4	371.8	381.6	389.0	396.8
	SIP, %	27.2	28.5	29.2	29.8	30.4
Finland	GDP, \$ billion	207.3	217.0	217.9	219.0	221.7
	SIP, %	21.6	22.6	22.7	22.8	23.1
Russia	GDP, \$ billion	3,031.0	3,226.6	3,397.8	3,498.0	3,576.8
	SIP, %	7.3	7.8	8.2	8.4	8.6
Korea	GDP, \$ billion	1,473.7	1,559.4	1,624.6	1,698.9	1,784.0
	SIP, %	2.3	2.4	2.5	2.7	2.8
China	GDP, \$ billion	12,357.0	13,810.3	15,154.3	16,585.0	18,088.1
	SIP, %	11.1	12.4	13.7	14.9	16.3

Source: (Bloomberg Innovation Index, 2016), (Gross domestic product..., 2016).

As is seen from Table 1, the higher the share of innovation-oriented entrepreneurship in the structure of economy, the higher the level of the country's GDP. Thus, in Australia, which has 13th position in the rankings of the most innovative countries of the world according to Bloomberg, the share of innovation-oriented entrepreneurship in the total structure of economy constituted 30.4% in 2014. At that, the level of GDP constituted \$396.8 billion.

The share of innovation-oriented entrepreneurship in the structure of Finland's economy constituted 23.1% in 2014 (7th position in the ranking of countries as to economy's innovativeness), GDP – \$221.7 billion; Russia, which has 12th position in the ranking as of 2014, has 8.6% share of innovation-oriented entrepreneurship in the structure of economy. The level of the country's GDP constituted \$3,576.8 billion.

South Korea, while ranked 1st as to the level of innovativeness of economy, has 2.8% share of innovation-oriented entrepreneurship in the structure of economy with GDP of \$1,784.0 billion in 2014. In China (21st position), the share of innovation-oriented entrepreneurship in the structure of economy constituted 16.3% in 2014, and GDP constituted \$18,088.1 billion.

The model of paired linear regression for the Austrian economy has the form $y=13.05x+1.75$. That is, with increase of the level of innovation-oriented entrepreneurship in the structure of Austrian economy by 1%, its GDP grows by \$1.75 billion. Correlation coefficient constitutes 98%. The Finnish model of regression has the following form $y=9.59x+4.54$. That is, with the increase of the share of innovation-oriented entrepreneurship in the structure of economy by 1%, its GDP grows by \$4.54 billion. Correlation coefficient constitutes 97%.

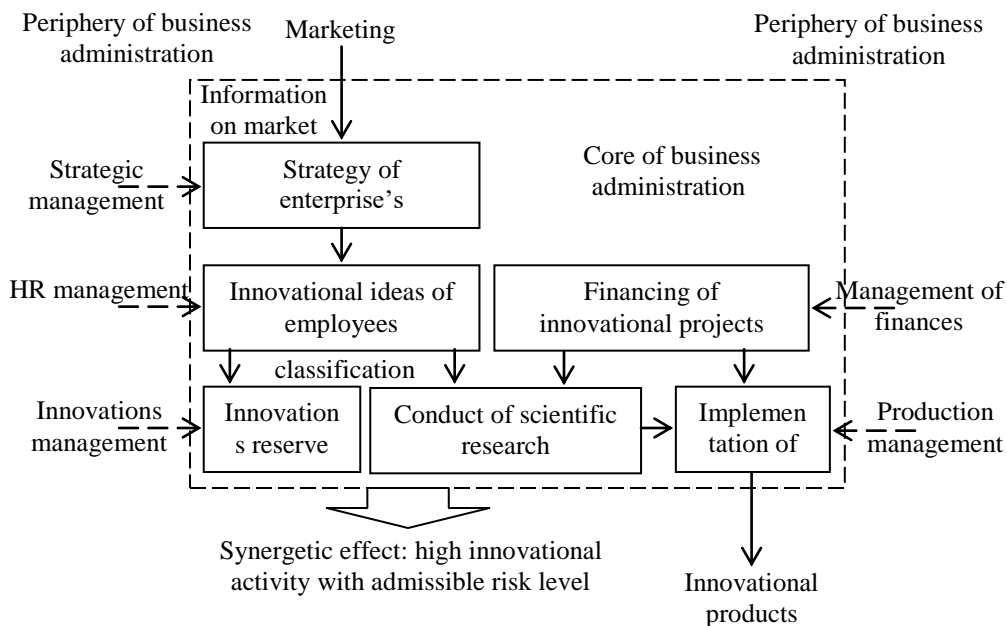
Russian model of regression has the form $y=415.90x+1.36$. That is, with increase of

the share of innovation-oriented entrepreneurship in the structure of Russian economy by 1%, its GDP grows by \$1.36 billion. Correlation coefficient equals 96%. Korean model has the following form: $y=637.14x+2.27$. That is, with increase of the share of innovation-oriented entrepreneurship in the structure of Korean economy by 1%, its GDP grows by \$2.27 billion. Correlation coefficient constitutes 99%. The Chinese model has the following form: $y=1,109.72x+2.19$.

That is, with the increase of the share of innovation-oriented entrepreneurship in the structure of Chinese economy by 1%, its GDP grows by \$2.19 billion. Correlation coefficient constitutes 95%. All the received models of paired linear regression are statistically significant.

Thus, the results of regression analysis confirmed the offered hypothesis and proved that innovation-oriented entrepreneurship does stimulate economic growth and development of modern economic systems. For maximization of the determined effect, this work offered the proprietary systemic approach to business administration of innovation-oriented enterprise (Fig. 1).

Figure 1. *Systemic approach to business administration of innovation-oriented enterprise*



As is seen from Fig. 1, the core of business administration of innovation-oriented enterprise within the offered systemic approach is innovational process, while managerial process goes to the background (being peripheral), contrary to the usual approach to business administration.

Within the innovational process, information on the market is used for creating a strategy of development of enterprise. Stimulation of creative activities within HR management stimulates emergence and manifestation of innovational ideas. These ideas are classified depending on the level of innovativeness, demand in the market, potential possibility for commercialization (getting profit from them), and risk level.

The most perspective innovational ideas that correspond to the corporate strategy of development and suppose the minimal level of risk and increased nor of profitability are further developed within scientific research, while others are directed into the reserve of innovations. After that, technologies are implemented into the production process, and innovational products are manufactured.

Systemic approach to business administration of innovation-oriented enterprise ensures emergence of synergetic effect, related to high innovational activity with admissible risk level, which is not achieved within the usual approach. To prove the existence of this effect empirically, let us evaluate effectiveness of business administration of innovation-oriented enterprises of Russia within the usual and systemic approaches (Table 2).

Table 2. Results of evaluation of effectiveness of business administration of innovation-oriented enterprises of Russia within usual and systemic approaches

Enterprise	Approach to business administration					
	Usual approach (2015)			Systemic approach (forecast)		
	SI	LR	EBA _{i/p}	SI	LR	EBA _{i/p}
Kaspersky Laboratory	0.65	0.32	2.03	0.81	0.29	2.79
Yandex	0.54	0.27	2.00	0.69	0.25	2.76
IPG Photonics	0.73	0.36	2.03	0.85	0.30	2.83
Elektron	0.76	0.44	1.73	0.92	0.39	2.36
Neva-Metal Posuda	0.81	0.25	3.24	0.96	0.19	5.05
Dr. Web	0.54	0.31	1.74	0.73	0.27	2.70
Ecowave	0.62	0.28	2.21	0.82	0.24	3.42
Microbor Nanotech	0.69	0.34	2.03	0.87	0.31	2.81

As is seen from Table 2, by the example of Russian enterprises it is proved that systemic approach provides at least by 1.5 higher effectiveness of business administration of innovation-oriented enterprises, as compared to the usual approach, which shows existence of the stated synergetic effect and its importance for innovational sphere of economy.

Conclusion

Thus, the results of the performed research confirm the offered hypothesis and stimulate development of the concept of innovation-oriented economy, as they ensure scientific & theoretical platform for substantiation of necessity of its

functioning and development, the important place among which belongs to innovation-oriented entrepreneurship.

Apart from the stated high theoretical significance, this work possesses also practical value related to applicability of the offered method of evaluating the effectiveness of business administration of innovation-oriented enterprises and developed systemic approach to business administration in activities of modern innovation-oriented enterprises.

Concluding, it is necessary to note that the determined dependence between development of innovation-oriented entrepreneurship and achievement of high level and rate of economic growth reflects high significance of innovational entrepreneurship for successful functioning of temporary economic systems.

The developed systemic approach to business administration of innovation-oriented enterprise stimulates activation of endogenous factors and maximization of effectiveness of using internal potential of development of innovation-oriented enterprise.

However, for using the national potential of development of the sphere of innovations, it is necessary to have external stimulation of innovation-oriented entrepreneurship and creation of favorable conditions for its development. That's why further development of the concept of innovation-oriented enterprises supposes creation of complex approach to management of innovation-oriented entrepreneurship at micro- and macro-level.

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