

Investigation of the processes of enterprise development as a composite of the region's potential in the mining industry

**Sergei Golikov, Natalya Logunova,
Sergei Chernyi**

*Kerch State Maritime Technological University
E-mail: sergiiblack@gmail.com*

Abstract.

Insufficient use of the innovative potential of the region, absence of practical mechanism for stimulation and support of the innovative entities, increased amount of information and limited capabilities for its interpretation (due to undeveloped tools for sampling and processing of statistic data about current innovative activities of enterprises or institutions) make urgent the necessity of monitoring of innovative activities of enterprises in the Crimean Peninsula and development of the practical recommendations aimed at optimal combination of investment and innovative potential of participants of the innovative activities for their rational use.

Key words: INNOVATIVE DEVELOPMENT, SCIENTIFIC AND RESEARCH PROJECTS, INVESTMENTS, REGION.

Introduction

Monitoring of the innovative activities is the ground for the target innovation aimed at development and attraction of such pioneer projects which under modern conditions are able to give the largest profit. Such monitoring is made by systematic observations for development of the innovative processes [1], analysis and forecast of changes in the course of time as well as assessment of trends in the innovative development to form adequate economic and social programs.

For this purpose, the key prerequisite for the successful innovative development is activation of the innovative process providing implementation of the priority innovative projects and consolidation of competitiveness of the enterprises. In their turn, the companies being the carriers of the competitive benefits make the base for the competitive success not only in the sphere defined by their business but in all the branches of the regional economy [2, 3, 4].

Monitoring of indicators

According to the polling survey among the directors of the leading Crimean companies, the major reason for refusing the implementation of promising innovative developments into the production is lack of self-financing (profit; depreciation charges; capabilities for encouraging inner assets, monetary portion of charges of company owners) and difficulty in attracting credits due to high interests and absence of guarantees for repayment of borrowings. If in early 2000 equity funds were predominant in the structure of innovative expenses, in 2013 the percentage of own financial resources reduced by more than 80 %, meanwhile the share of other sources for funding (leasing, franchising, share participation, etc.) increased from 0.1 % up to 59.9 % (Fig. 1).

Almost complete absence of the governmental support for the innovative activities and unwillingness of foreign donors to make financial investments into the Republic of Crimea (first of all, due to the inadequacy of legislative and regulatory framework) focused the attention of the local government author-

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ities to the necessity of funding the innovative active participants at the regional market (25% of the total amount of the innovative expenses was allocated from the local budget in 2013). A particular increase in innovative expenses was observed in 2011. Almost

88.2 % of these expenses were given to purchase of machinery, equipment and software. In its turn, it resulted in increased amount of scientific and R&D activities made by institutions on their own [4,5].

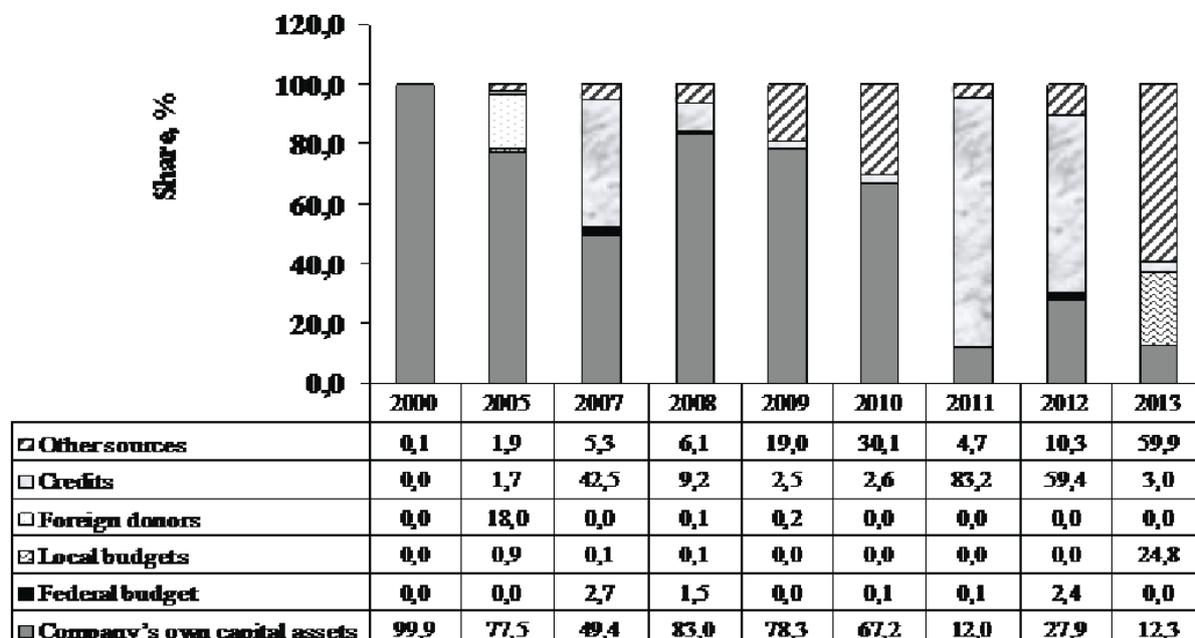


Figure 1. Structure of sources for funding innovative activities by Crimean companies, %

By taking into consideration the large outflow of scientists (by factor of 2.6 for 1995-2013), due to the small salaries of scientific staff and “age” barrier for the comprehensive scientific research (50 % specialists with degree of Doctor of Science were above 61 years and more), attention should be paid to the growth of innovative active industrial enterprises in the region (from 11.9 % up to 15.2 % in the total amount of industrial enterprises). These enterprises, being mostly in the sphere of production of foodstuffs, beverages and tobacco products, electronics and optic

devices, machine building as well as production and distribution of electric power, gas and water, are the main participants of the innovative process in the region. Moreover, a certain disproportion in dynamics of development of the innovative active companies at the regional market may be observed. Enlarged share of innovative active companies unfortunately does not result in increased share of the companies that implement innovations a number of which reduced from 10.5 % down to 8.2 % for 2000-2013 (Fig. 2) [6-8].

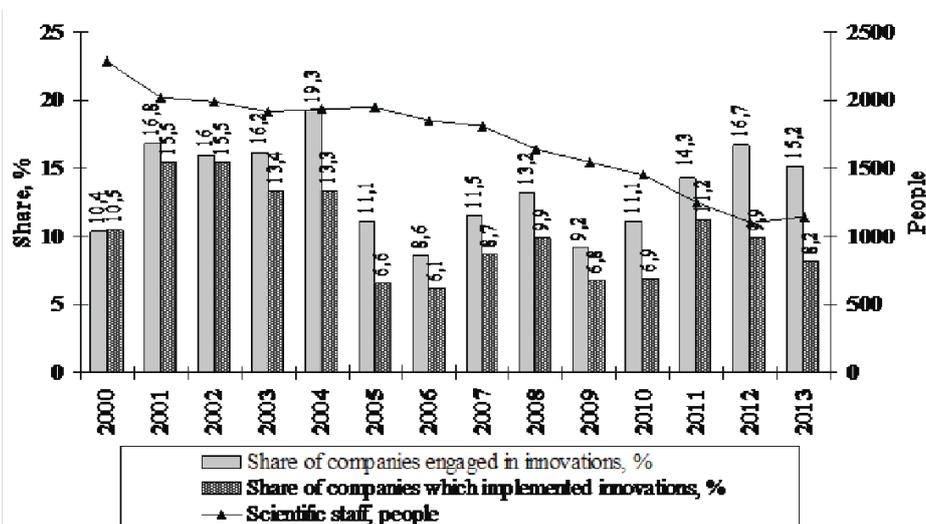


Figure 2. Interrelation of the number of scientists and a number of innovative active companies in the Republic of Crimea

Models and algorithms implementing problems

Thus, contrasted with the general positive dynamics of the innovative development of the companies in the Republic of Crimea, the amount of the sold innovative products tended to be reduced. It proves cutting down in demand for innovations among the population and other institutions and necessitates the comprehensive study of market requirements and correct evaluation of the market situation. The major targets in this study are as follows: analysis of consumers of innovations with their differentiation under demographic, social and economic, geographical, psychological and psychographical criteria. Dynamics of changes in these parameters, analysis of the competition conditions and the level of the scientific and engineering potential of a certain company as a basis of the economic validation of the innovative strategy should be taken into account. An innovative item of goods should be studied in details in order to match the information about its technical, operational and other specific features as well as capabilities as for the formation of the added user value [9, 10].

Having regard to the most important factors contributing to the growth of the innovative activity of companies (general social and economic level of development, availability of skilled staff, investments to the capital facilities, the level of education in population) and in order to forecast the level of innovative development of the region under the lack of statistical information and validation of the key trends of the economic policy in the innovative sphere as well as to find the quantity parameters changing which one can achieve the desired outputs, economic and mathematic simulation was made based on elaboration of the regression estimated equation. This equation enables to assess the degree of impact of the population of students of higher education institutions for 1000 people (x_1); gross regional product for a human, mln. US\$/people (x_2); ratio of scientific staff in the share of economically active population, % (x_3); volume of investments to the capital stock per capita, mln. US\$/people (x_4) for the volume of implemented scientific and R&D activities per capita, thousand US\$/people (Y). As a result, the following constraint equation was produced:

$$Y = -3.912 + 0.102x_1 + 2.074x_2 + 8.189x_3 + 0.603x_4 \quad (1)$$

$$R^2 = 0.9805$$

Estimations according to the developed pattern demonstrated that a number of university students per 1000 people has the greatest impact on the volume of scientific and engineering activities. Enlarged number of these students for 1 % results in increased volume of innovations for 1.07 %. The level of workforce productivity expressed via the gross regional product per

one employee in the public production has also a great impact. Its increase for 1 % contributes to growth of scientific and engineering technologies made by companies on their own for 0.92 %. This exactly conforms the common statement about the value of the most important resource of any state – human. A share of scientists in economically active population is of great importance for activation of innovative activities of companies. This is proved by parameters of the regression equation (coefficient in x_3): increase in staff of scientific institutions for 1 % contributes to growth of innovations more than for 8 thousand US\$/per capita.

These findings would be an integral part of the institutional activity. Along with this, new products should be produced at the enterprises based on new knowledge, and the organized innovative infrastructure will be a rigorous link at all the stages of production.

One of the ways forward for increasing the innovative activities by companies in the District is to create a regional innovative cluster by combining in a certain sphere relevant companies, scientific and research organizations, governmental and financial institutions contributing to the efficient use of competitive benefits and providing effective innovative development of the region based on the synergetic cooperation of all the participants.

Building up the model for functioning the innovative cluster should be based on certain quality parameters, such as: coherence of the cluster, which characterizes the level of mutual influence of its components as well as access to the necessary resources; effect of synergy which is a set of potentials of the cluster participants; a cluster basic element making a main contribution to the organization of interactions and being a driving motive of the system; a cluster nuclei comprising the organizations providing the main output of its performance; reserves of increase, i.e. those structures and organizations potential of which is not completely discovered but is able to transform into base services and to overcome vulnerable spots.

Summary. In order to forecast the level of the regional innovative development under the conditions of lacking the statistic data and to validate the key directions for the economic politics in the innovative sphere as well as to find the quantity parameters whose changing allows achieving the outlined results, the economic and mathematical simulation was made. It enables to evaluate the degree of influence of essential factors contributing to the growth of the innovative activity of the business entities on the scope of R&D activities per capita.

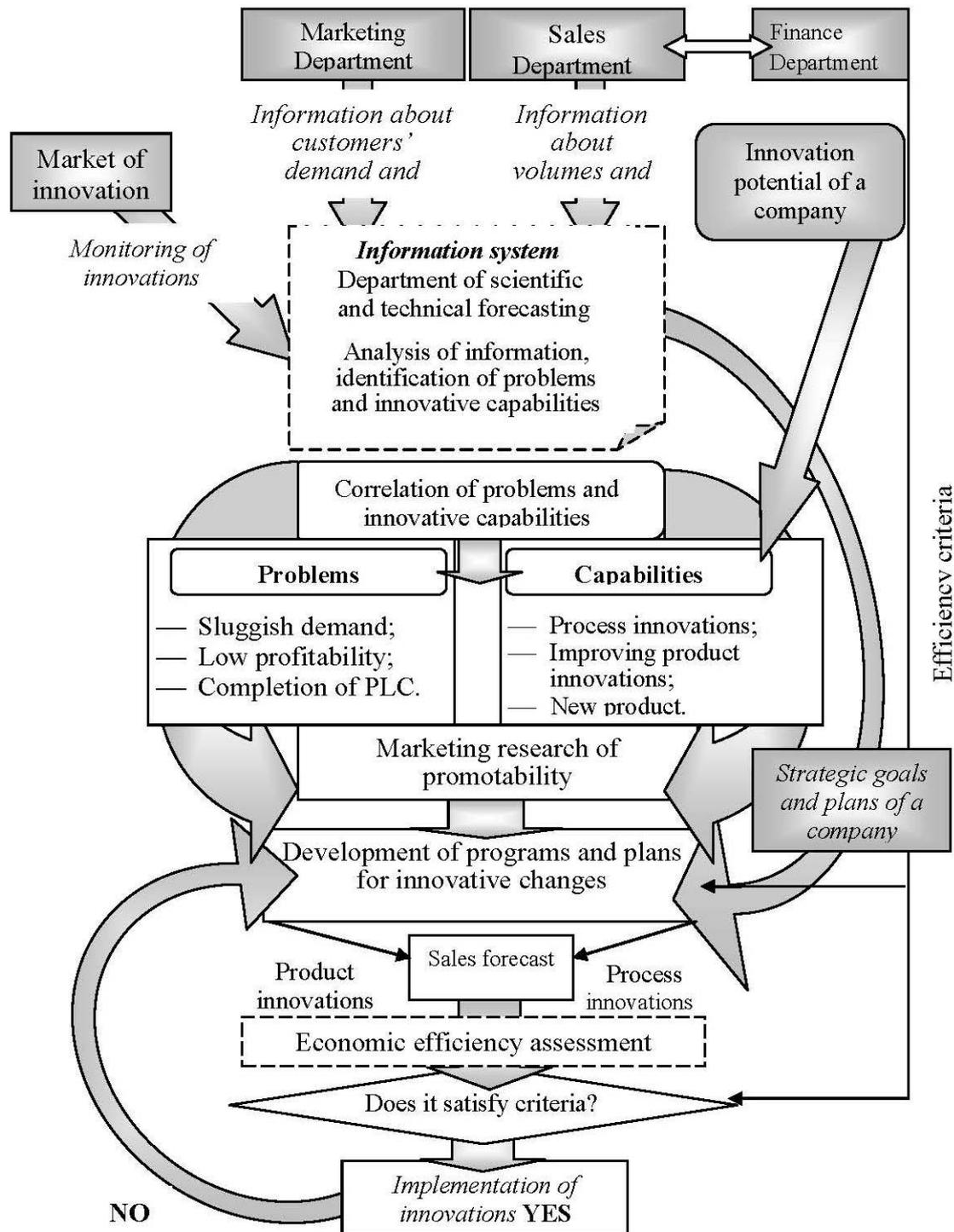


Figure 3. Monitoring of innovations in the system of planning innovation processes at a company

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