

METHODOLOGICAL APPROACHES TO ESTIMATE THE EFFICIENCY OF INNOVATIVE TECHNOLOGIES IMPLEMENTATION

**Komelina Anna A., post-graduate student.
Poltava national technical Yuriy Kondratyuk university**

© Komelina Anna A., 2013.

Received by the editorial board: 12th September, 2013

Subject Topicality. Evaluating the efficiency of the present-day national innovation and investment policy requires the development of methodological schemes to evaluate the efficiency of innovative technologies implementation. At the micro level the innovative technologies in modern conditions are the most efficient means of developing companies, providing their strong market position, forming the basis for competitive advantages, and the acting commercialization mechanisms determine the rate of the latest developments implementation. At the macro level, the impact of the national innovation and investment policy concerning the innovative technologies and their rapid introduction into the economy is expressed in terms of the socio-economic development of the country and the region and possesses comprehensive nature. Justification of the methodological and methodical approaches to evaluating the impact of the introduction of innovative technology makes it possible to estimate the rate of structural changes and the pace of modernization in various sectors of the economy.

Goal and Objectives of the article: to develop methodological approaches for assessing the impact of innovative technologies introduction into the economy of the region.

Analysis of the existing publications. Among a number of publications devoted to the issue of innovative technologies commercialization, we should mention the work by Chukhray N.I., Korotkov T.L., Vlasov A.V. et al. [1 - 3]. Approaches to the evaluation of investment projects in different economic systems were studied in the works by Arslanova S., Livshits V, Baldin K.V., Vorobyov S.N., Berezovsky N.P., Vilna P.L. and others. [4 - 7] However, the need to develop additional methodological approaches for assessing the impact of the innovative technologies introduction, based on the systematic ground, is still existing.

Main material statement. Major participants in the commercialization of innovative technologies are different entities, and implementation of innovative technologies is always accompanied by a set of risks. Thus, the important task is to improve approaches to evaluating the impact of the development and practical implementation of innovative technologies into production. This approach should take into account the main stages of the innovation process, accompanied by the emergence of complex relations for creating and promoting intellectual products (scientific idea or innovation) and the existing mechanisms of attracting and stimulating the main participants of this process (state, regions, enterprises, research and educational institutions, scientists, entrepreneurs and innovators, innovation intermediaries, etc.).

Methodologically, it is important that the impact of the innovative technologies introduction and selection of their commercialization mechanisms depend on the model of sectoral markets that are formed in the economy of the region or country. It is known that there are two main models of the innovative technologies: to-push («pushing" on the market), and to-pull («involvement" in the market) [1, p. 275 - 277, 2, 3]. For the first of these inherent commercialization mechanisms on bringing innovative technologies to the market, that is the traditional scheme of the process "research – production – sale." The advantage of this model is primarily the fact, that all participants in this model formally (or informally) are members of the innovation cluster, and their combined actions are in-

tended to produce effects by their interaction and consistent promotion of innovative technologies. In the process of innovation clusters formation it is important to evaluate the innovative capacity of its members and the possibility of internal and external funding for the development and implementation of technological innovations.

The second model is characterized by a different mechanism of innovative technologies commercialization and interaction of market participants: science-research research-designing organizations are "involved" in the process of innovation activity as a result of a certain "order" for innovation to solve a particular problem. Under these conditions, the risks of the project shift to the so-called "customers."

For each of the above market models it is important to select the mechanism of innovative technologies commercialization in view of the economic impact of the participants interaction in the innovation process, which, however, are the subjects of this market. If in the first case (model to-push) the efficiency estimation of this interaction is an economic impact of the created innovation cluster operation formed as a combination of innovative activity of each participant and their total cluster interaction (synergy), in the second case (model to-pull) the efficiency estimation is the result of individual activity of each of the innovation process entities and their position in this market.

Methodological approaches for assessing the impact of the innovative technologies introduction should include various options of innovative activity of each participant of the innovation process, among them the key ones are:

- The level of innovation significance for an enterprise (new scientific and technological discoveries, a new mode of production, a radically new engineering equipment, technology, materials, energy, current modernization to raise the technical level of production, quality and competitiveness of products, environmental protection, new forms organization and management);

- nature of the of the innovation activity result (regeneration, retention and renewal of existing functions, change of quantitative features, regrouping components for the purpose of improvement, adaptive change elements of the production system, the simplest qualitative change that goes beyond the adaptive changes, a new generation and changes in the most of the system properties, a new form, a qualitative change of initial properties, higher changes in the system functions);

- specific stage of the innovation commercialization (basic research, applied research, implementation, development, technological innovations in the sector; consumer innovations adoption);

- scale of the innovative activities implementation effect (those that only affect the activities of the company that sells them, and those that affect the performance of other firms, those that achieve the effect at the national level, those that achieve the effect internationally).

Other important condition for innovation activity of the innovation process participants is selected funding source for Innovative Technologies (income, depreciation costs, long-, medium- and short-term loans, venture capital investments, paper issue, the state budget, special funds, foreign capital), its availability and cost. In addition, the time interval and the scale of the innovative process should be taken into account: strategic (long-term) - large projects; current (medium) - medium projects; current (annual) - medium projects; current (mid-term or annual) - medium or small projects; operational (short-term) - small projects.

In addition, taking the decision of giving the financial support from the government or regional authorities to implement innovative technologies in the broad sense of the term, one should consider the compliance of the potential recipient company's activity to the innovation and investment development priorities at the national and regional levels and its efficiency.

In most cases, researchers suggest to determine the economic and non-economic impact of the entity's innovative investment activities. [11] The economic efficiency must include a profit from the entity's innovation activities, which should be somewhat higher than in the normal course of business, which allows not only to continue active innovation to improve quality and reduce product prices, increase production rates, to be competitive in a certain marketplace, but also to protect the entity creating insurance reserves and providing liquidity. The economic results of innovation and investment activity of a company (other than profit growth) include:

- Budgetary performance, which results in higher amounts of tax and non-tax payments to budgets of all levels;
- Social impact, associated with increasing income of employees and others.;
- Revenue growth of third-party entities, allowing them also to have some economic and non-economic performance.

Non-economic result is derived from the economic one and is in a close correlation with it. Non-economic results should be viewed in terms of the effect for the society, i.e. social, the essence of which is to improve people's life. Thus, the social impact of the entity's innovation activities at the national and regional levels is expressed through:

- Budgetary performance, which is achieved by means of the empowerment of society to improve social benefits to low-income families, pensioners, veterans, the disabled, separate individuals, subsidies for housing services for unprotected sections of the population, increase of state employees' wages, creation of social infrastructure providing social housing, etc.;
- Scientific and technical performance, the nature of which is revealed through creation of conditions for labor intellectualization, introduction of automated systems and robotization, active use of information technology and advanced equipment, changing functions of people in the production process and their involvement in research, management and control activities. That is, the scientific and technological effect on society lies primarily in the creation of more favorable conditions, reducing injuries in the workplace, increasing the length of leisure time, opportunities to improve skills, meet their personal needs in terms of providing stable number of jobs or even raising employment;
- Resource ecological performance, the meaning of which is revealed through improving resource management efficiency, reducing emissions of pollutants, limiting the extent of the environment transformation and so on. That innovation should include the use of only environmentally friendly, safe, energy-saving technologies, improved production and products, ecological products, environmental recovery and so on.

Under the conditions of significant increase in the energy consumption of national production, limited national energy resources and the instability of the global market the task of evaluating the energy efficiency of investment projects is getting increasingly urgent. In the present-day conditions, this approach permits to reduce the risks of enhancing price competition between manufacturers by reducing energy costs in the cost price value.

It should be noted, that the budget, science and technology, resource ecological and energy efficiency accompanying innovation, are not necessarily expressed only in the social sphere, they can be expressed separately, without influence on it.

Innovative activity produces the effect expressed in the ability to diffuse and in self-reproduction, because the economic impact not only provides liquidity and financial strength of innovative businesses, increase profits of other companies and workers' income, generates non-economic effect, which provides a high level of the society's life standards, scientific and technological development, improvement of environmental situation and natural resources protection, but is eventually transformed into the economic effect.

The current state of Ukraine's economy requires investment transformation into the innovation process as a key factor of economic growth that provides economic restructuring on a new technological basis, and contributes to its competitiveness. The efficiency of the investment support to the company's innovative development, the actual process of technology commercialization, the mechanism of transfer is determined by many factors, which are shown in Fig. 1.

The classification allows you to:

- determine the effect of factors that characterize the process of implementing innovative technologies at the enterprise,
- determine the features of the investment process innovation;
- compare the significance level of innovation for the company and the extent of their investment;
- determine the effect of the investment support source, its implementation etc.

The suggested classification approach can form the basis of a comprehensive evaluation of the innovative technologies implementation.

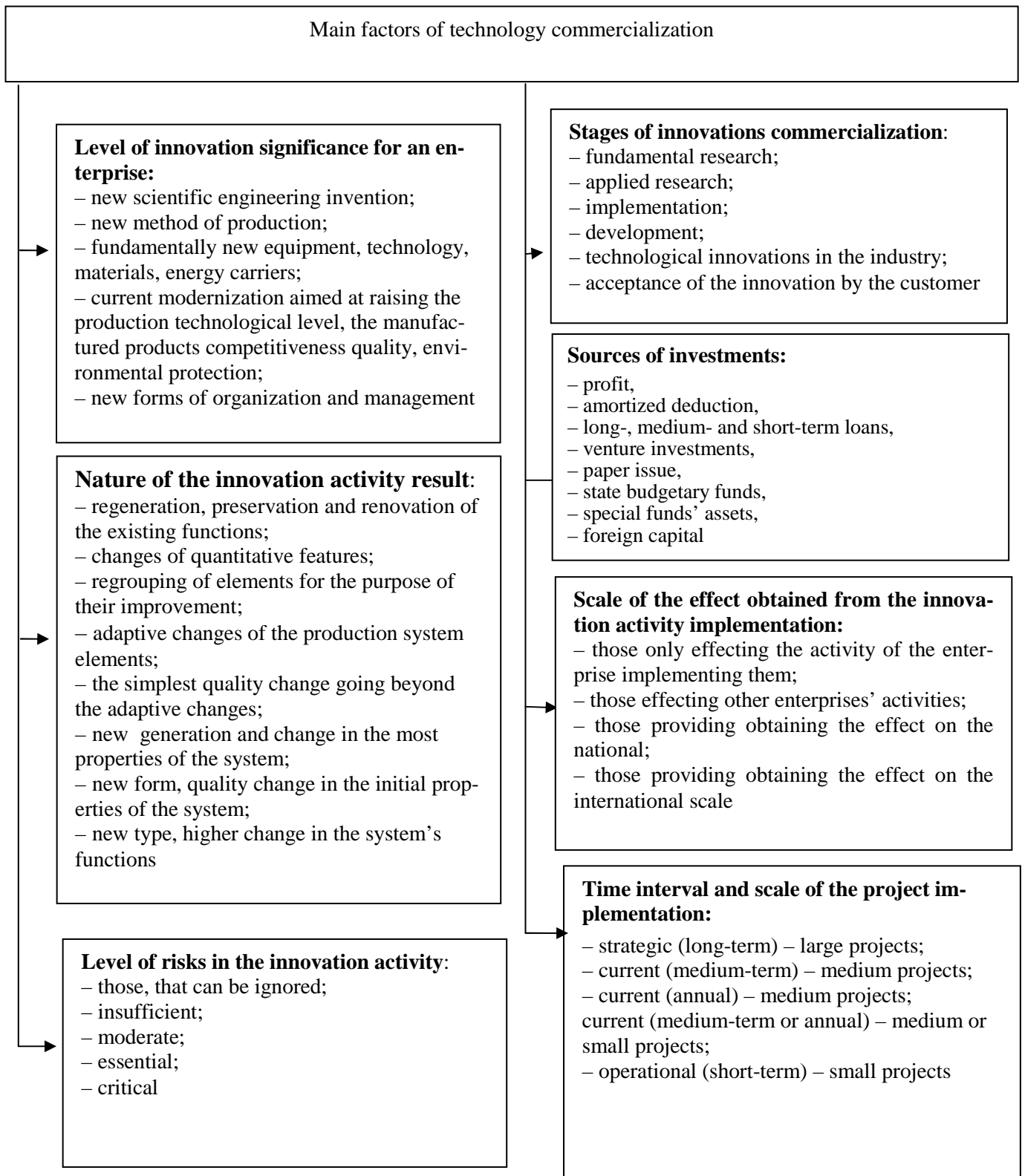


Fig. 1. Classification of the factors effect on the commercialization process and the choice of their transfer mechanism

One of the main problems today prevents the formation of innovative entrepreneurship. It is the virtual absence of investment support from the region and the government. At the same time, the low level of innovative enterprises development and the formed innovative environment parameters are significantly limiting the innovative development of the regions and the country as a whole. In Ukraine, traditional and available for West-European companies sources of financing innovations has

not been formed so far. Of all the existing reasons complicating the access of businesses to the sources of financing innovation, it is impossible to choose the only main one. This problem is multifactorial, related to both the objective and subjective factors.

Conclusions. The process of implementing innovative technologies affects the parameters of economic growth, the rate and extent of expanded social reproduction, which is associated with investing tangible and intangible values into research and technological development, innovation projects, and provides updating and upgrading of production enterprises in various sectors of the economy, efficiency of entrepreneurship and social programs. It is important to take into account the expected impact of the innovative technologies introduction, both economic and non-economic. The above mentioned conditions characterize the features of the innovation process agents' innovative activities, that can not but affect the functioning of regional innovative technology markets. Improving the efficiency of interaction between the participants of the innovation process requires the government to regulate primarily the following processes: formation of innovation infrastructure and support of innovative projects implementation; defining the priority areas of economic activity at the national and regional levels and transition to project management; improving the investment attractiveness of territories; improvement of regional mechanisms to encourage innovations and investments on the basis of activating the innovative technologies commercialization. [3]

The complexity of governmental innovation and investment policy formation in Ukraine is caused by the fact, that it has to provide multiple view innovation priorities, as well as the innovation activities efficiency of economic entities and central, regional authorities and local self-government bodies.

REFERENCES:

1. Чухрай Н.І. Близькість організацій при створенні інновацій: сутність, складові та оптимальний рівень // VI Міжнародна науково-практична конференція «Маркетинг інновацій і інновації в маркетингу». 27-29 вересня 2012 р. – Суми : ТОВ «ДД «Папірус», 2012. – 337 с.
2. Chukhray N.I. Proximity of organizations in the innovation process: the essence, components and the optimal level // VI International research practical conference “Marketing of Innovations and Innovations in Marketing”. September, 27-29, 2012. – Sumy: TOV “DD”Papirus”, 2012. – 337 p.
3. Короткова Т. Л., Власов А. В. Коммерциализация и маркетинг инноваций. - М.: Креативная экономика, 2012. - 168 с.
4. Korotkova T.L., Vlasov A.V. Commercialization and marketing of innovations. – М.: Creative Economics, 2012, 168 p.
5. Комеліна О.В. Стратегія трансформації інноваційно-інвестиційного простору України: теорія, методологія, практика - К. : ТОВ «ДКС центр», 2010. - 486 с.
6. Komelina O.V. Strategy of the Ukraine's innovation investment space transformation: theory, methodology, practice. – К.: TOV “DKC centre”, 2010, 486 p.
7. Арсланова З., Лившиц В. Принципы оценки эффективности инвестиционных проектов в различных системах хозяйствования / З. Арсланова, В. Лившиц // Инвестиции в России, 1995. - №2. – С. 21-38;
8. 4. Arslanova Z., Livshits V. Principles of investment projects efficiency assessment in different economic systems / Z. Arslanova, V. Livshits // Investments in Russia, 1995. – No. 2. – P. 21-38.
9. Балдин К.В., Воробьев С.Н. Риск-менеджмент: учебное пособие. - М.: Гардарики, 2005. - 285 с: ил.
10. Baldin K.V., Vorobyov S.N. Risks Management: tutorial. – М.: Gardariki, 2005. – 225 p. ill.
11. Березовская Н.П. Оценка эффективности инвестиционных проектов с учетом экологических факторов: автореф. дис... канд. экон. sciences. / Н.П. Березовская; Ниж. Гос. Тех. Ун-т. - Н. Новгород, 2007. – с. 23: ил.
12. Berezovskaya N.P. Assessment of investment projects efficiency with a glance of ecologic factors: synopsis of PhD in Economics dissertation. / N.P. Berezovskaya. Nizhniy Novgorod State Technical University. – N. Novgorod, 2007. – 23 p. ill.
13. Виленский П.Л. Оценка эффективности инвестиционных проектов: Теория и практика. 2-е изд., перераб. и доп. / П.Л. Виленский, В.М. Лившиц, С.А. Смоляк. - М.: Дело, 2002. – 888 с.
14. Vilenskiy P.L. Assessment of investment projects efficiency: theory and practice. Second edition, revised and augmented. / P.L. Vilenskiy, V.M. Livshits, S.A. Smolyak. – М.: Delo, 2002. – 888 p.

UDK 332

Komelina Anna A., post-graduate student, Poltava National Technical Yuri Kondratyuk University. **Methodological approaches to estimate the efficiency of innovative technologies implementation.** The article presents methodological approaches for estimating the impact of innovative technologies introduction both at the enterprise level and at the level of the country and region. They may be used in the formation of the national and regional innovation and investment policies.

Keywords: innovative technology, performance, market innovation, commercialization mechanisms.

УДК 332

Комеліна Анна Андріївна, аспірант, Полтавський національний технічний університет ім. Ю. Кондратюка. **Методологічні підходи до оцінювання результативності впровадження інноваційних технологій.** Запропоновано методологічні підходи до оцінювання результативності впровадження інноваційних технологій як на рівні підприємства, так і на рівні держави й регіону. Такий підхід може бути використано при формуванні державної та регіональної інноваційної й інвестиційної політики.

Ключові слова: інноваційні технології, результативність, ринки інновацій, механізми комерціалізації.

УДК 332

Комелина Анна Андреевна, аспирантка, Полтавский национальный технический университет им. Ю. Кондратюка. **Методологические подходы оценивания результативности внедрения инновационных технологий.** Предложены методологические подходы к оценке результативности внедрения инновационных технологий на уровне предприятия, региона, государства. Такой подход может быть использован при формировании государственной и региональной инновационной и инвестиционной политики.

Ключевые слова: инновационные технологии, результативность, рынки инноваций, механизмы коммерциализации.