

УДК 65.011.00176

## THE INNOVATIVE ACTIVITY OF INDUSTRIAL ENTERPRISES AS A FACTOR OF INCREASING THEIR COMPETITIVENESS

T.I. Cherkasova, Ph.D., associate professor

I.M. Boyko

S.V. Beznos

*Odessa national polytechnic university, Odessa, Ukraine*

*Черкасова Т.І., Бойко І.М., Безнос С.В. Інноваційна активність промислових підприємств як фактор підвищення їх конкурентоспроможності.*

Наведено огляд сучасного стану інноваційної активності промислових підприємств. Обґрунтована важливість та запропонована схема управління впливом інноваційного проекту на конкурентний ризик промислового підприємства. Визначена роль технологічного аудиту як інструмента реалізації інноваційної програми підприємства.

*Ключові слова:* інноваційна активність, конкурентоспроможність, технологічний аудит

*Черкасова Т.И., Бойко И.М., Безнос С.В. Инновационная активность промышленных предприятий как фактор повышения их конкурентоспособности.*

Приведен обзор современного состояния инновационной активности промышленных предприятий. Обоснована важность и предложена схема управления воздействием инновационного проекта на конкурентный риск промышленного предприятия. Определена роль технологического аудита как инструмента реализации инновационной программы предприятия.

*Ключевые слова:* инновационная активность, конкурентоспособность, технологический аудит

*Cherkasova T.I., Boyko I.M., Beznos S.V. The innovative activity of industrial enterprises as a factor of increasing their competitiveness.*

An overview of the current state of innovation activity of enterprises was represented. The scheme of managing the innovation project influence at industrial enterprise competitive risk was suggested and its importance was proved. The role of technological audit process as a tool for implementing enterprise's innovative programs was determined.

*Keywords:* innovation activity, competitiveness, technological audit

The current economic situation's characteristic features should include permanent changes in the entrepreneurs' economic relations complexity level as a result of their integration into the world economy and competition growth. It is important that all changes now occur against the background of Ukrainian post-crisis economic recovery and of its industry modernization strategy implementation. One of the promising ways to ensure effective industrial upgrading in Ukraine and to provide economic development of certain industrial enterprises is their innovative activity. Practice shows that industrial enterprises' innovative activity can not only provide economic development high levels, but also improve the modern enterprises' competitiveness, their export potential. Innovation activities are an integral part of the successful enterprises functioning ensuring process in both long and short periods; it is provided by purposeful influence on the industrial enterprises development potential.

### Analysis of recent researches and publications

The scientific researches devoted to the problems of enterprises' competitiveness and their innovative development were exposed by foreign and Ukrainian economists: D. Bell, P. Druker, M. Porter, I. Shumpeter, R. Fathutdinov, V. Geets', V. Grynyova, N. Kvasnytska, P. Pererva, L. Fedulova, A. Yakovlev, O. Yastrems'ka and others.

However, there haven't been paid enough attention to the issue of process innovations' influence on competitiveness.

The purpose of the article is to determine the characteristics of industrial enterprises' innovative activity influence on the competitiveness level; to develop a scheme to control the innovation project influence on competitive risk of industrial enterprises.

### The presentation of the main material

Implementation of innovation activities results on the industrial enterprise is a major factor to improve the products' competitiveness. It provides the increase in market demand for the company's products and ensures the growth of its operations financial results, both by introducing new products and reducing the enterprise's production costs. This is explained by increased productive resources using efficiency,

introduction of energy-saving and low-waste technologies, that create the conditions for long-term stability. Enterprises that are innovation-oriented should have a creative approach to determining ways of consumer needs meeting; taking it into account they should improve and upgrade products, technical and technological base of the company to strengthen its market positions and to ensure the planned positive financial result.

The problem of ensuring the industrial enterprises' innovative activity growth is important for Ukraine, because the problem of production efficiency increasing is in front of each business structure, and its solution requires the introduction of various innovative solutions. However, it should be noted that innovation activity of the country is still not

sufficiently developed, as evidenced by national statistics. In 2012 the quantity of industrial enterprises engaged in innovation activities reached 1,758 enterprises (17.4% of the total industrial enterprises number), in 2011 there were 1,679 companies (16.2% of the surveyed industrial enterprises). Positive trend that is shown in fig. 1 indicates that an increasing number of industrial enterprises realize that an active innovation activity is the prerequisite for maintaining its competitiveness. Even in 2009, when the financial result before taxes in industry was negative (-4760.7 million UAH), the number of innovation-oriented enterprises was growing, and in general for the last five years their share increased by 4.6 %.

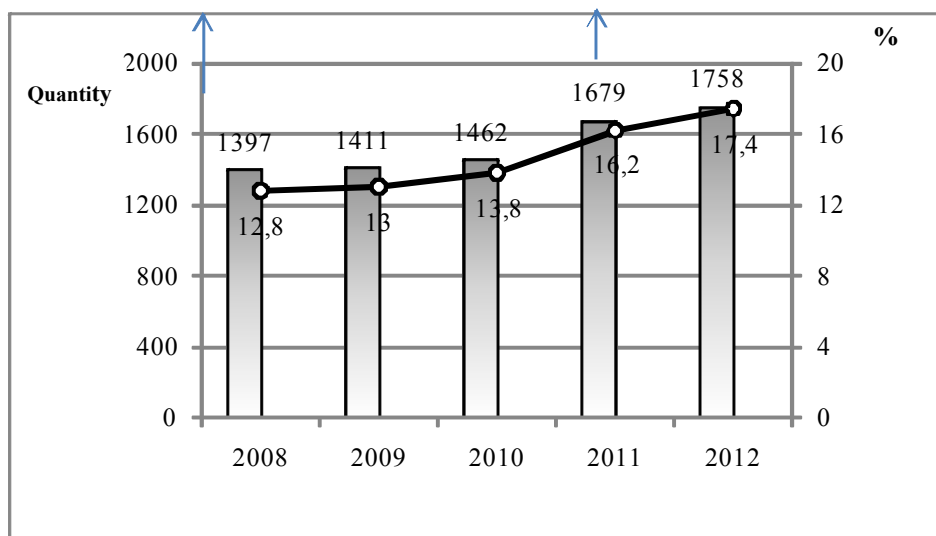


Fig. 1. The dynamics of industrial enterprises innovative activity during 2008 - 2012. (based on the Ukrainian State Statistics Service data [3])

Dynamics of the enterprises that introduced innovations quantity in 2008-2012 was sustained (Table 1), and the share of such enterprises has increased over the period by 2.8%. Enterprises paid particular attention to the introduction of new technological processes but their number in 2012 compared to 2011 year decreased by 12.8%. It is noteworthy that this reduction was done not by low-waste and resource-saving technological processes whose impact on the enterprises' competitiveness needs no explanation. These achievements can't be considered sufficient, because the share of innovative products in industrial output was continuously decreasing over this period from 5.9% to 3.3%, so the innovative factor did not provide industrial enterprises' revenue growth.

In 2012, 1037 companies sold innovative products for 36.2 billion UAH (3.3% of the industrial production total volume), in 2011 it was 42.4 billion UAH (3.8%). Innovative products realization for

export in 2012 was carried out by 332 companies in the amount (13.36 billion UAH, 36.9% of total innovative products sales) and there was growth compared to 2011 (12.6 billion UAH). Export growth can be seen as sufficient novelty confirmation of innovative solutions in the context of their impact on the industrial enterprises competitiveness.

It is noteworthy that small share of the innovation products export is related to the general low level of competitiveness that may depend on various factors: absence of complete information base on innovative projects implemented, weak material, technical and scientific base, insufficient governmental financial support of domestic industrial enterprises, low level of management decisions substantiation about the selection of innovative projects that should be implemented on the enterprise, insufficient analysis of the predicted trends and dynamics changes in the product market, insufficient consideration of risk generated by the environment.

Table 1. Dynamics of industrial enterprises' innovative activity main indicators

Indicators	Years				
	2008	2009	2010	2011	2012
Number of firms that implemented innovations	1160	1180	1217	1327	1374
% to the previous year, %	-	101,7	103,1	109,0	103,5
The share of firms that implemented innovations, %	10,8	10,7	11,5	12,8	13,6
Quantity of new processes implemented	1647	1893	2043	2510	2188
% to the previous year, %	-	114,9	107,9	122,8	87,2
including low-waste, resource-saving	680	753	479	517	554
The production of new products implemented	2446	2685	2408	3238	3403
including new kinds of techniques	758	641	663	897	942
The share of innovative products sold in total volume of industrial products, %	5,9	4,8	3,8	3,8	3,3

\* based on the Ukrainian State Statistics Service data [3]

Analyzing the data in Table 2, it should be said that the main source of innovation financing were own funds, whose share in the total costs of innovative activity financing varied from 52.9% to 65%. In 2012, funds of foreign investors in the innovation sphere constituted 8.7% of the funding.

Table 2. The distribution of the innovative activity financial providing' total volume in Ukraine (by financing sources)

Financing sources, million UAH	Years									
	2008		2009		2010		2011		2012	
	million UAH	%	million UAH	%	million UAH	%	million UAH	%	million UAH	%
The total cost, including:	11994,2	100	7949,9	100	8045,5	100	14333,9	100	11480,6	100
- own	7263,9	60,6	5169,3	65,0	4775,2	59,3	7585,6	52,9	7335,9	63,8
- state budget	336,9	2,8	127,0	1,6	87,0	1,1	149,2	1,0	224,3	1,9
- foreign investors	2411,4	30,0	56,9	0,4	2411,4	30,0	56,9	0,4	994,8	8,7
- other sources	4277,9	35,7	1140,6	14,3	771,9	9,6	6542,2	45,6	2925,6	25,4

\* based on the Ukrainian State Statistics Service data [3]

Comparing to the previous year, foreign direct investments to the innovative activity financing significantly increased, but their share in total funding remains insufficient.

Innovating has a significant impact on the competitiveness of enterprises, allowing to increase their activities' effectiveness. But this process is characterized also by a number of factors that hinder the company's development and significantly increase the risk changes management process; it can negatively affect the level of industrial enterprises' competitiveness.

Among these factors the important one is the lack of sufficiently complete information base about the input data of innovative projects, that leads to wrong projects benefits assessments, reduces the effectiveness of projects commercialization phase and makes it impossible to coordinate the innovation process subjects' activity, that may negatively affect the company's competitive position. Evaluation of the competitive risk sources and the innovation project's influence on industrial enterprise's competitive risk is one of the problems that require urgent solutions

(Fig. 2). In our opinion, the project's competitive position on the technology market is one of the direct competitive risk of new product or technology implementation, and it is fundamental for ensuring the new products competitiveness at the long period of time. This technological innovation provide the highest level of the project's effect, because it is impossible to carry out the production of fundamentally new products without them, and production of traditional products reduces production costs. The process technological innovations indirectly characterize the level of product novelty for product market and affect the high demand period using correct prognostic assessment of product market development.

Taking into account the information above, we can say that special importance is acquired by technological audit as a tool to implement innovative transformations based on company's technological reorganization. But in order to provide the reorganization effectiveness it is necessary to carefully analyze all the features and parameters

characterizing objects and to identify forward-looking economic indicators.

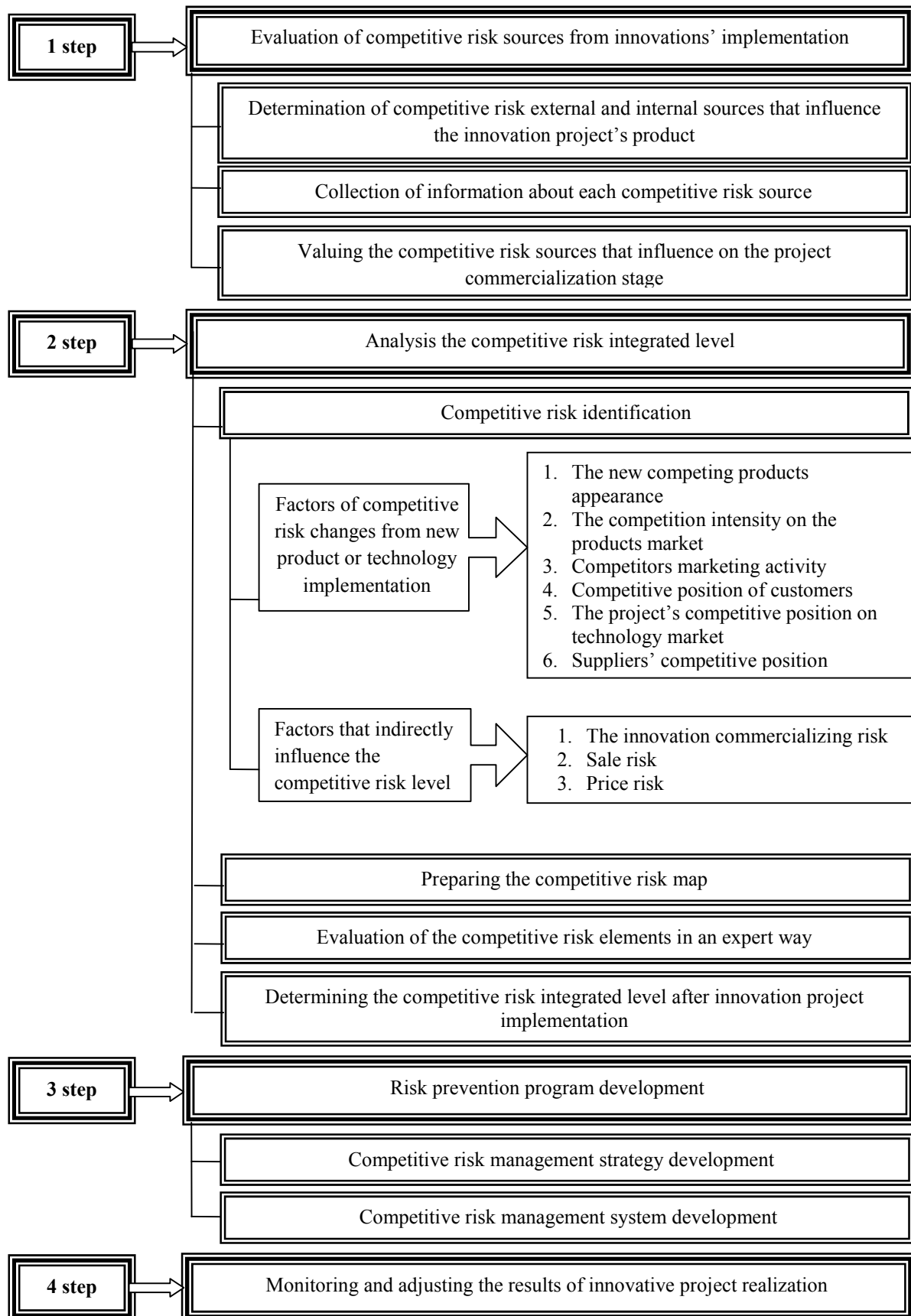


Fig. 2. The scheme of innovation project influence management process on the industrial enterprise's competitive risk

This imposes additional requirements to the scientific substantiation of methods that are used during audits, terms and conditions of the technological audit standardizations, initial information requirements determining. The technological audit concrete result is a description of company's industrial and technological base, its management system and information base, supply and cooperation system characterization. These features take into account the technologies that are used on the enterprise, but the general results of the audit include the results of the competitors technology review, the "technological standard" definition, which is necessary for the company development, recommendations for technology projects portfolio formation. The technological audit results will be the base for the enterprise's innovative development program in order to increase its competitiveness level.

The next stage of the industrial enterprises' innovative development program should solve the technology transfer issue, which has become a mandatory part of the business re-engineering. Technology transfer is now considered as a tool for enterprise's innovation and technical management, it requires the creation of an industrial enterprises knowledge base, which will include enterprise's technological developments archive (accepted and rejected), description of production business processes and their interrelation, company's product portfolio characteristics, new product digital characteristics, quality management system characteristics, etc.

Solving the technology transfer problem involves the external information collecting: permanent control, new products and technologies external research information overview and analysis, this information can be used on the enterprise. Technology market scanning and monitoring are the basis of the technology transfer. Different countries use different approaches to managing this process: there are consulting and technology centers and other similar government agencies that carry out the selection of literature about the appropriate technological information, private companies and organizations give consulting services.

Interrelation of external and internal economic technology transfer management mechanism will provide an enhanced level of this tool use in the industrial enterprises practice efficiency. In our view, such mechanism should be based on three components: technological audit, appropriate enterprise knowledge base development and analysis system, assessment of the investments in selected technologies effectiveness, which would take into account not only the cash flows associated with the new technologies implementation, but also the possibility of further modification.

Results of technical audit and search for technology transfer solutions will determine on the one hand the project's output parameters, the level of

new product competitiveness, project's life cycle, and on the other hand the capital and operating budgets of the project, which will clarify the necessary funding amount.

Thus, it can be noted that the search for the most economical methods of innovation-oriented enterprises development program realization in order to ensure its competitiveness requires a qualitatively new integrated approach to innovative projects portfolio formation, that will provide a close correlation between evaluation of existing technical and technological production status, assessment of technological development prospects and taking into account the innovation project individual risk.

The suggestions aimed at overcoming the barriers that hinder the development of innovation on industrial enterprises include: formation of corporate information system that will provide accumulation, collection, processing, storing and giving information in the innovation and technological development field; improvement of legislative and regulatory acts protecting intellectual property in the industrial sector.

### **Conclusions**

Enhancing the industrial enterprises competitiveness level in today's economic environment is directly related to innovations, and the formation of long-term competitive advantages is provided by the creation of effective information technology environment, that on the one hand takes into account changes in the environment and on the other hand - the interaction between all the production processes of industrial company.

The development of innovation-oriented industrial enterprise depends on its choice and purchasing the new technologies whose implementation ensure its competitiveness over the long period of time. A significant level of expenditures required to purchase and implement process innovations, the innovation processes of this type effect on the company competitiveness and its strategic decisions need to be improved by decision-making risk reduction. In our opinion, the task of technological innovation projects portfolio formation is particularly important, because that will allow them to substantiate their importance to achieve the development strategic objectives and to introduce them according to solving the problem of maintaining the necessary competitiveness level in the long period of time.

This problem solution requires interaction between enterprise and existing technology transfer nets and innovation commercialization centers that can help businesses find partners to implement the project and to enter new markets, and also to investigate the potential demand for new technologies, to carry out technological marketing, to implement innovative project ideas more purposefully and effectively. All of this will increase the enterprises' competitiveness.

**References:**

1. Квасницька Р.С. Особливості інноваційної діяльності підприємств у сучасних умовах / Р.С. Квасницька, Н.С. Ардашкіна // Вісник Хмельницького національного університету. – 2009. – № 6, Т. 3. – С. 247-251.
2. Мартинюк В.М. Забезпечення конкурентоспроможності продукції шляхом здійснення інвестиційно-інноваційної діяльності / В.М. Мартинюк // Економіка: проблеми теорії та практики : зб. наук. праць. – Дніпропетровськ, 2005. – Вип. 207, т. II. – С. 441-449.
3. Офіційний сайт Державної служби статистики України [Електронний ресурс]. – Режим доступу: <http://www.ukrstat.gov.ua/> .

Надано до редакційної колегії 23.08.2013

Черкасова Тетяна Ігорівна / Tetyana I. Cherkasova  
[t.cherkasova.od@gmail.com](mailto:t.cherkasova.od@gmail.com)

Бойко Ірина Михайлівна / Iryna M. Boyko  
[myiro4ka@yandex.ua](mailto:myiro4ka@yandex.ua)

Безнос Світлана Володимирівна / Svitlana V. Beznos  
[s\\_beznos@ukr.net](mailto:s_beznos@ukr.net)

**Посилання на статтю / Reference a Journal Article:**

*The innovative activity of industrial enterprises as a factor of increasing their competitiveness [Електронний ресурс] / Т.І. Черкасова, І.М. Бойко, С.В. Безнос // Економіка: реалії часу. Науковий журнал. – 2013. – № 4 (9). – С. 149-154. – Режим доступу до журн.: <http://www.economics.opu.ua/files/archive/2013/n4.html>*