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METHODS EFFECTIVENESS EVALUATION OF INVESTMENT PROJECTS OF INNOVATION IN PUBLIC-PRIVATE PARTNERSHIP

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Introduction and aim of the research: Particular importance for enhancing innovation policy development takes cooperation of the state and the private sector in the choice of priorities of innovation development. The author proposed the method of evaluating the effectiveness of investment in innovative development projects based on bipolar approach to the interaction of corporate triangle within a cluster based on the type of public-private partnerships.

Research hypothesis. Using of this approach, unlike the current will form an effective and efficient innovation infrastructure in Ukraine to actively develop innovation activity and boost the innovation potential at regional level to attract investment and access international markets.

The aim. Formation of methods of evaluating the investment effectiveness of ranking innovation projects in the innovative development of the formed triad of the interaction cluster between public, private and high-tech sectors.

Methodology: complex analysis (to study the components and prerequisites for implementation of the innovation policy of Ukraine), comparative, economic and mathematical analysis (to identify the problems and peculiarities of implementation of regulatory innovation policy of Ukraine), structural, cluster analysis (to develop measures to improve the innovation policy of Ukraine).

Results: formed the ways of activation of innovative development policy of the format of public-private partnership based on the choice of innovation development priorities.

Conclusions: proposed the methodology of evaluating the investment effectiveness of ranking innovation projects in the innovative development of the formed triad of the interaction cluster between public, private and high-tech sectors aimed at selection of optimal investment options based on a combination of key criteria.

Keywords: bipolar approach corporate triangle, cluster, public policy, investments, method "Expert Choice".

Problem and its connection with important scientific and practical tasks. The national system of innovation development creates a system of relations between science, industry and society, where innovation are the basis of economic development, and the need for innovative development, in turn, largely determine and stimulate most important directions of scientific activity. Of course, within this general model can be formed some national characteristics. Usually they occur in greater or lesser role for the state and the private sector in the implementation of certain functions, as well as in large and small businesses in these processes, the ratio of basic and applied research and development, the dynamics of sectoral and regional structures of innovations. Effective implementation of the innovation process is impossible without investment earnings; in nowadays in the period of economic and political crisis, current issue serves as a method of evaluating the effectiveness of investment projects of innovation development, which determined the purpose of further research.

Analysis of recent publications on the issue. Foreign scientists made important contribution to the theory and practice of regulation of innovative development: F. Ahiyon [11], N.S. Ayrapetyan [1], D. North [7], Y. Schumpeter [10]. As for the scientific labors of local scientists should be mentioned: L. Vorotin [9], A. Halchynskiy [5], L. Hanushchak-Efimenko [6], M. Yermoshenko [8], P. Erokhin [8] and others.

Remaining part of the study. However, despite the significant number of publications and their scientific and practical importance, a number of issues concerning economic and institutional levers of innovation regulatory policy requires clarification and development of new approaches. In particular, the need of further study and improvement of methods for evaluating the effectiveness of investment projects of innovation development in the public-private partnership.

The aim of the research. Formation evaluating methodology of the investment effectiveness of ranking on innovation in the development of innovative cluster triad, models of interaction between public, private and high-tech sectors aimed at selection of optimal investment options based on a combination of key points - criteria: creating the conditions for innovations; the reliability of the system; readiness to implement innovations in public-private partnerships.

The presentation of the main results and their justification. The dominant role in increasing the competitiveness of national products, the state must take an active participation in the global technology market. Ukraine is not yet a high-tech country, formation and development of its scientific and technological capabilities have become a major factor in the crisis. Areas of state support of innovative development of the economy that are realized through enhanced policy of public-private partnership in the innovation sphere, has no alternative option of forming and supporting initiatives in the implementation of innovative projects and effective intensification lever of domestic policy of innovative development at the macro, meso and micro levels.

As part of the mentioned cooperation more active organization of technology transfer through direct transfer of intangible technologies from science to production (and in the opposite direction - in the case of industrial application development that are important to science) or the creation of new technological companies, initially targeting the introduction of their new quality development and integration of industrial and scientific research institutions (creation of innovation clusters). It is a basis for the formation of cooperative relationships in research and development between the private sector (production) and state scientific and technical sector (Figure 1).

In forming innovative cluster, state authorities coordinate participants. Regional management will be, for example, defines cluster members, the specifics of their relationships, and forms a package of projects that are to be performed, and so on. Scope of science block includes training of future professionals; conducting training courses among staff; implementation of research specialization within the cluster; development of innovations in all areas of the cluster and more.

Incorporating science block in the structure of the cluster is possible with long-term functioning of the cluster, as in this case, the participating companies after adaptation to the new conditions can plan various innovations, trainings for their staff.

Educational institutions that are part of the cluster should have a specific training program for their staff that reflects the possibility of achieving advanced knowledge and skills in the area of specialization of the cluster. So science unit interacts with other members within the cluster to provide them with educational and research services, receiving financial reward.

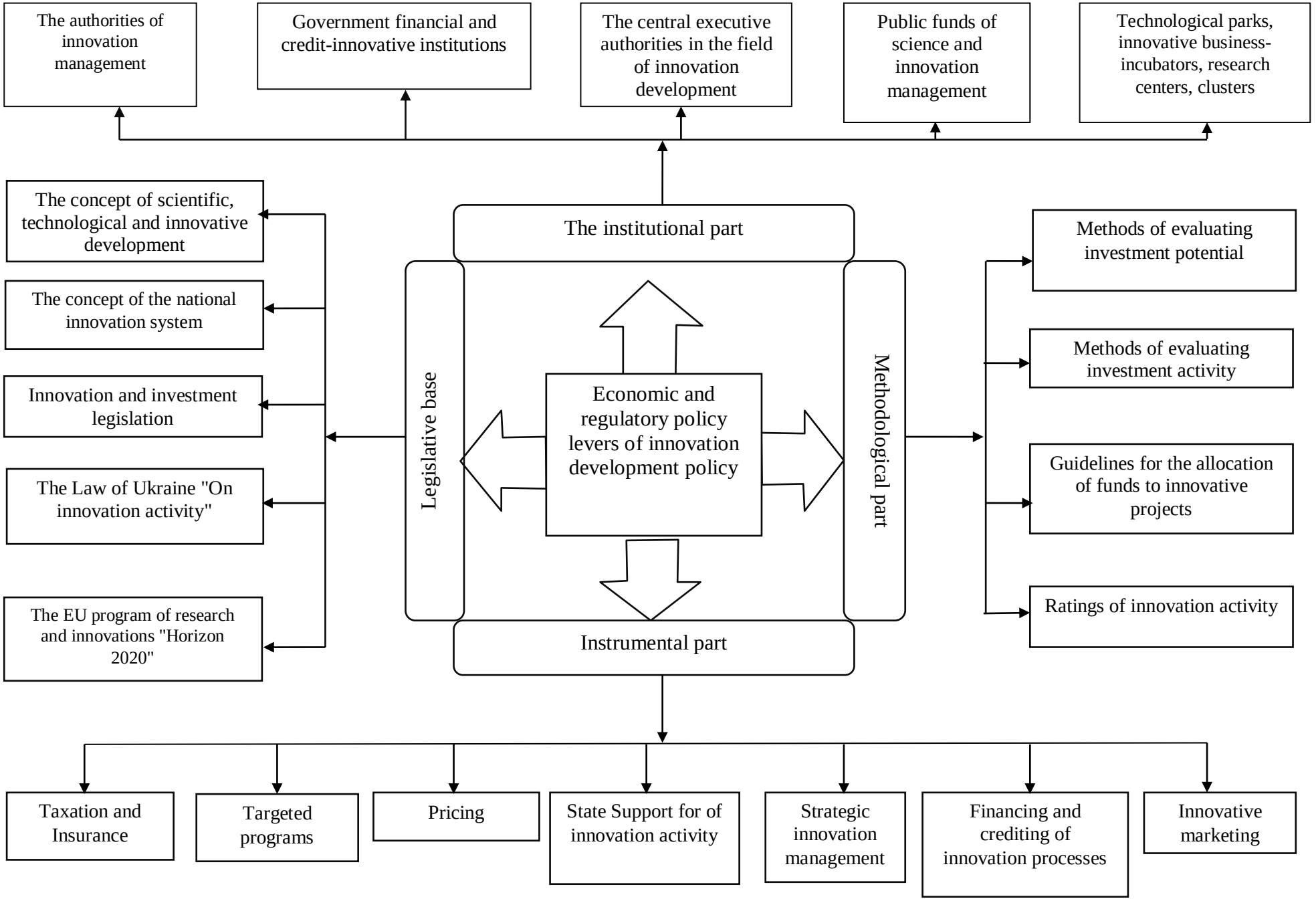
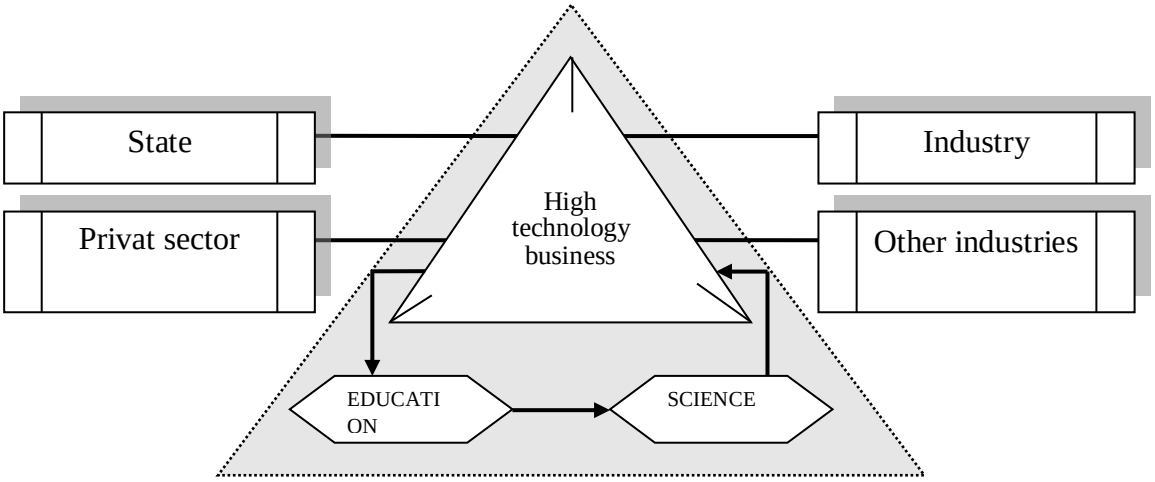


Figure 1. Economic and regulatory levers of organizational innovation development policy of Ukraine

Source: author's development

Block of economic and legal support represent organizations that provide various services (legal consultations, services of accounting, audit services, etc.). Note that at the present stage of economic development the competitive products are those that meet modern quality requirements. Therefore, innovative products - an integral part of a successful business because it allows us to offer products that differs from analogues in price and quality.

Economic and organizational levers of regulatory policy exercise significant influence on the policy of innovative development by implementing a public-private partnership of innovation development projects, the model of the so-called "corporate triangle", which is a crucial component of the scientific sector, which includes (Figure 2): knowledge-intensive business which uses the results of scientific achievements and specifies the requirements for graduates of educational institutions in modern society; infrastructure units, which should take into account market requirements of employers, causing competitiveness and demand for graduates; R & D results which should be aimed at providing public goods through satisfaction of interests for industry and business development, providing citizens with high quality of life and overall country's competitiveness at the global market.



Source: author's development

Figure 2. **Corporate triangle of cluster type system "education-science-knowledge-intensive business"**

As a part of such cooperation, should be performed the conditions for the formation of scientific and educational business complexes (innovative clusters) as effective organizational structures for innovation development of public-private partnership for today. Formation of innovation clusters is an effective lever of organizational innovation development at the regional level, strategic orientation is the aim at intensification of interaction between local industry and business and improving of people's lives.

The structures that make up the cluster are able to prepare highly qualified professionals according to the needs of the organization; reduce the terms of technology transfer to the market from the developer to the consumer; increase the level of assessment of the significance of scientific results through the development of experimental facilities; to participate in the system of relations of public-private partnership on the principles of project management. Anticipated results of the implementation of educational and scientific-industrial cluster are: Increased access to innovations and technologies; Commercialization of scientific developments; Change of the strategy of professional education; Improvement of the quality of training; Dialogue with the employer: understanding of common interests and challenges.

Evaluation of projects' innovative development within the framework of public-private partnerships is calculated by determining the number of effects and overall efficiency of investments in cluster structure, with taking into account specifics of cooperation and levels of government regulation at the macro, meso and micro levels.

$$E_k = \frac{\sum_{i=0}^{T} \frac{\text{ГН}_i^t}{((1+d)(1+p))^t} - \sum_{i=0}^{T} \frac{\text{ГВ}_i^t}{((1+d)(1+p))^t}}{\sum_{i=0}^{T} \frac{K_i^t}{((1+d)(1+p))^t}}, \quad (1)$$

E_k – the effectiveness of the cluster, ГН_i^t – cash proceeds, obtained by enterprise *i* during certain time period *t*, ГВ_i^t – cash expenditures of enterprise *i* during certain time period *t*, K_i^t – investments of enterprise *i* during certain time period *t*, *d* – discount rate, *p* – annual inflation.

Types of effects of using model "of corporate triad" of cluster type within a public-private partnership, are presented in Table 1. The effectiveness of innovative investment is accompanied by synergy arising from the interaction of all levels (macro and micro) and the emergence of new properties. The proposed cluster mechanism to identify and strengthen the synergy potential at every stage of the investment requires choosing such a decision, the implementation of which will develop adaptive properties and allows achieving target sales volume and income.

Table 1

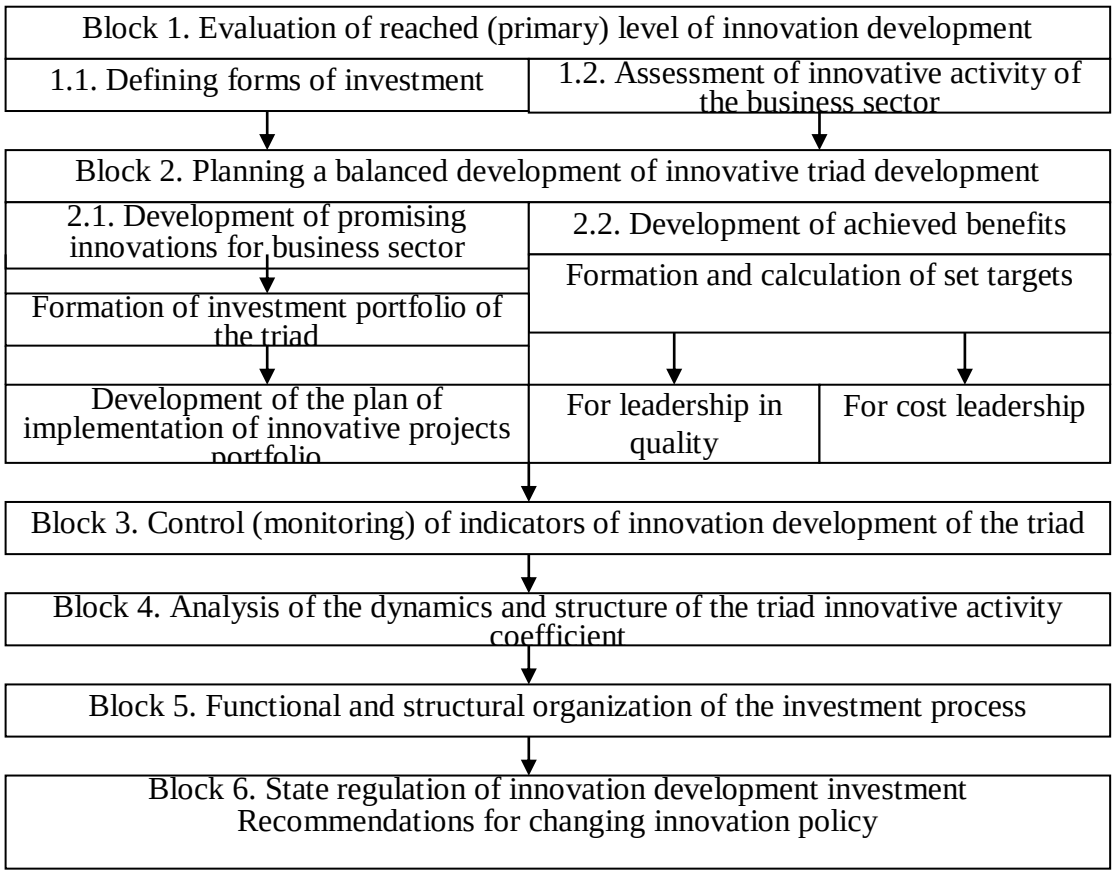
The effects of cluster formation in the framework of public-private partnerships

At micro level	At meso level
The effect of lowering transaction costs	
Reducing the cost of organizing business, information search, negotiation, conclusion and execution of contracts for legal protection, building relationships with external contractors and members of the internal cluster	Formation of the cluster in the region is a tool that allows the authorities to reduce transaction costs
The effect of the economy of scale	
Development of specialization cluster promotes the development of all its members, resulting in increased production of cluster as a whole and reducing unit costs. Within emerging cluster that stimulates the production of new products and services	Expansion of "coverage" allows cluster to enter new markets, and has positive impact on the development of related industries
Cooperation of cluster members allows the use of multi factor in various enterprises while minimizing transaction costs	The use of many functional factors in various enterprises associated with the reduction of the budget of the region
Anti trigger effect	
Appears by co-financing of participants of innovation cluster. Trigger effect occurs when the initial implementation of innovation or primary production must make a lot of expensive changes, resulting income from basic innovation or production may cost even less than necessary reorganization. In individual firm risk of this effect is large enough. At the cluster firms can minimize the cost of these secondary changes, allowing them to implement a variety of technologies	Regional public authorities is the coordinator of the cluster, which allows controlling the use of financial resources. This leads to stable positive results. For cluster, communication network creates favorable conditions for their rapid spread
Synergetic effect	
The growth of performance of cluster members in result of their integration	The growth of the efficiency of the region development as a result of the formation of industry clusters

Source: author's development

This effect can be achieved by channeling of investments into the development of innovative development component that can be a point of innovation growth.

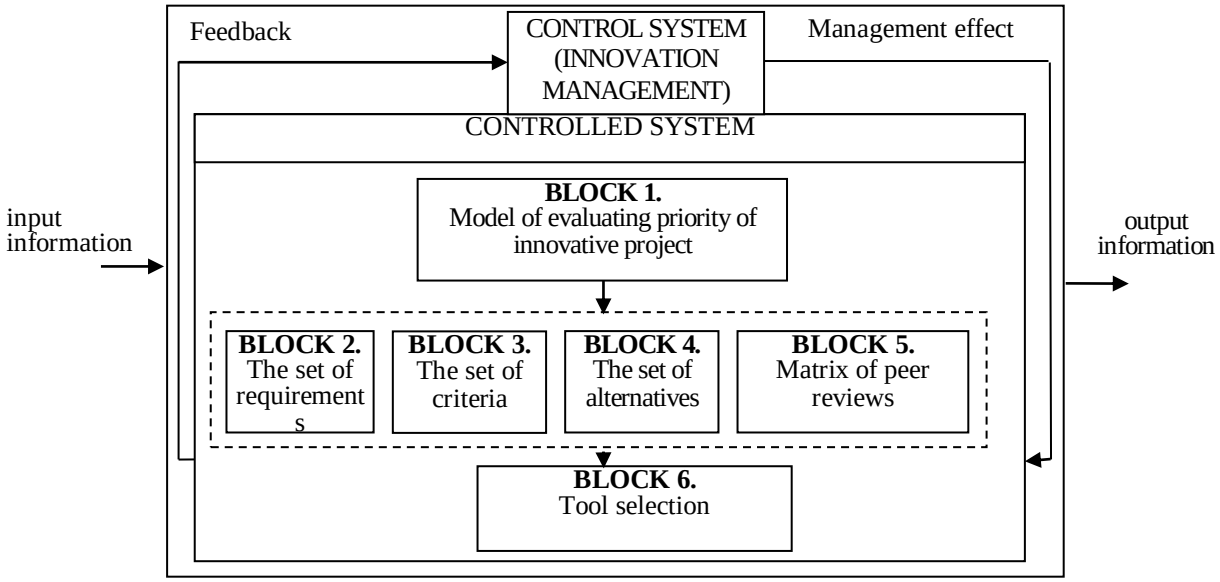
On the basis of interaction between public and private sectors and high-tech innovation cluster consisting of cluster performance systematized mechanism in stages depicted in Figure 3.



Source: improved by author [7]

Figure 3. Functional scheme of investment in innovation cluster triad

Scientific novelty of the proposed methodology consists in taking into account the specific characteristics of the innovative regulatory policies of integration development and non-financial methods of project evaluation, application of mathematical modeling to create innovative portfolio and determine the most favorable conditions for its implementation, and evaluation of innovative development. Innovative possibilities should be considered as the complex ability of the triad to develop its business through the introduction of various kinds of innovations. Effective organization and implementation of innovation is only possible through the integrated use of own and borrowed resources. The achieved level of efficiency of investment of innovation activity is conditioned due the gap between the available resources and the actual level of use, which shows the effect of various factors. Comparison of potential resources and actual use allows you to compare the effectiveness of innovative investments in different conditions. Value of the potential and actual levels of use of investment resources is an important characteristic of an innovative process. Best performance results acquired in the case where the ratio of actual and potential efficiencies greater than one. Based on the main idea of the proposed investment cluster mechanism of innovative development, the basic principles of justification of optimal decision-making theory and characteristics of decision-making in the field of innovation development were formed and structured in Figure 4.



Source: improved by author on the basis of [7]

Figure 4. **Model of evaluating investment efficiency of innovation projects at the macro level**

As seen from the sequence of selected innovation projects (Figure 4) evaluation of the effectiveness of investment of innovation projects at the micro level consists of the following stages:

1) determining the set of requirements that apply to each of the estimated innovation projects described by vector of input variables:

$$E \in G,\ G=\{E|E \subset V;\ E \subset K;\ E \subset A\}, \quad (2)$$

$V=(V_1,V_2,\ldots,V_m)$ – Vector of innovative project requirements;

2) determining criteria by which is possible the reasoned implementation of the selected innovation:

$$K=(K_1,K_2,\ldots,K_k), \quad (3)$$

3) Vector of innovative project evaluation criteria formed in accordance with specified third stage vector of alternatives of innovative project:

$$A=(A_1,A_2,\ldots,A_n), \quad (4)$$

4) at the fourth stage the matrix of expert assessments of innovative alternatives to the project is formed:

$$\Theta=[\theta_{ij}]_{m\times n}, \quad (5)$$

θ_{ij} – estimation of requirements i by j alternative;

5) forming tools to select the most efficient project of all proposed:

5.1) determination of the state vector of alternatives obtained through requirements:

$$S=(S_1,S_2,\ldots,S_n), \quad (6)$$

5.2) determining vector of finite set of alternatives, obtained by the resulting stabilization set of alternatives:

$$A'=(A'_1,A'_2,\ldots,A'_s),\ s \le n, \quad (7)$$

5.3) forming estimation matrix by experts:

$$\Theta'=[\theta'_{ij}]_{k\times s}, \quad (8)$$

θ'_{ij} – estimation of i criteria by j alternative;

5.4) formation of evaluation vector of alternatives (innovation projects), derived from the evaluating by criteria:

$$S'=(S'_1,S'_2,\ldots,S'_s). \quad (9)$$

In evaluating the efficiency of investment of innovative project of several alternatives the problem arises when:

- allocation of the most significant in terms of system operation and management of the innovation process component vectors V, K, A (vector-set of requirements, criteria and alternatives: formula (4) - (9);
- stabilizing the set of alternatives in determining the final set of alternatives A '(set of alternative projects);
- determining the best alternative A'opt from the final set of alternatives.

Using the proposed model of evaluation of innovation projects efficiency enables taking decisions about choosing investment option. With the developed model, we can define the priorities that can most effectively influence the activities of triad by certain criteria implement innovative projects.

As a result of prioritizing alternatives emerges portfolio of innovation projects triad, for investors should be implemented:

$$B_i\left(i=\overline{1,h}\right), \quad (10)$$

subsequently selected the factors which will make the ranking order of innovative projects introduction:

$$F_j\left(j=\overline{1,r}\right) \quad (11)$$

To determine the impact of weight each factor in ranking order emerges vector:

$$\varphi=(\varphi_1,\ldots,\varphi_r), \quad (12)$$

φ – weight of each factor impact.

To determine the specific weight of innovation project in a particular factor the matrix is used:

$$C=[c_{ij}]_{h\times r}, \quad (13)$$

c_{ij} – index of weight of factor *i* by *j* innovation project,
$0 \le c_{ij} \le 1$, $i = \overline{1,h}$, $j = \overline{1,r}$.

Estimation model of the efficiency of investment in projects is multi-objective optimization problem in which the prior criteria are the impacts on innovation processes. To solve the optimization problem must be implemented so-called multifactor coagulation. This procedure is a transformation of multicriteria on one scalar criterion for the construction of multi-objective optimization problem to a linear programming problem.

To determine the factors that influence the implementation of the priority, the linear convolution is used by the methods of multivector $\beta = (\beta_1, \ldots, \beta_h)$ as follows:

$$\beta_i = \sum_{j=1}^{r} c_{ij} \cdot \varphi_j \qquad (14)$$

Then prioritize investment model of innovation projects becomes:

$$\max_{x \in D} \beta(X)\ D = \left\{ x : \sum_{i=1}^{h} x_i = 1, x_i \ge \xi_0 \right\}, \qquad (15)$$

ξ_0 – necessary conditions for resource constraints ($0 \le \xi_0 \le 1$).

To limit the range of alternatives of innovative project is necessary to formalize a set of requirements that can be divided into two groups: functional and non-functional. Requirements of the first group determine the operation of business processes in cluster. Non-functional requirements are: economic, technical, technological, human, social requirements etc. In turn, when assessing the efficiency of investment in innovative project of the above two groups the evaluation criteria should be selected. To study the requirements imposed on the project, it is necessary to form criteria that enable to differentiate current advantages and disadvantages of the alternatives. These criteria can be divided into three types: the criteria that characterize the direct operation of the system; criteria that characterize parameters of innovation process; criteria that characterize the commitment to the project. Because innovation is constant, to make a choice, first must be created a framework criterion for the assessment of alternatives of innovative project (Table 2). The procedure for evaluating the effectiveness of investment can be optimized on the criteria base, which significantly reduces the preparation process to select and to prevent possible errors. Toolkit choice of alternatives is a sequence of execution of certain tasks: determining a final set of alternatives; the allocation of a better alternative. To develop tools for evaluating the effectiveness the hierarchy analysis method is used based on the software «Expert Choice».

Table 2

The base of criteria for evaluating the effectiveness of investment of triad innovation activity [4]

№	Criteria
Type of criteria: 1. The criteria that characterize functioning of the system	
Name of criteria: 1.1 Functional	
1.1.1	Functional sufficiency
1.1.2	The ability to integrate
Name of criteria: 1.2 Technical	
1.2.1	Technical sufficiency
1.2.2	Infrastructure of output (basic, servicing, auxiliary output)
Name of criteria: 1.3 Economic	
1.3.1	Total project cost
1.3.2	Return of the project
Type of criteria: 2. The criteria that characterize conditions of the innovation	
Name of criteria 2.1 Financial and economic	
2.1.1	Economic stability
2.1.2	Economic reliability
Name of criteria: 2.2 Organizational and technological	
2.2.1	The level of activity of the cluster
2.2.2	The availability of appropriate processes
Type of criteria: 3. The criteria for determining the readiness of the company to implement innovations	
Name of criteria: 3.1 Technical	
3.1.1	Technical sufficiency
3.1.2	Present value of technical adaptation of the project
Name of criteria: 3.2 Organizational and management	
3.2.1	The organizational level of production
3.2.2	The quality and compliance of personnel training level

Grouped under the method «ExpertChoice»

The process of evaluating the effectiveness of investment at the micro level involves three stages. The first phase - determining the content of the partial indicators that characterize the alternatives. At the second stage using the modified method of Saaty [4], is carried consistency of expert opinions. At the third stage, determined the sensitivity of all innovative projects that are preformed in innovative portfolio triad, using the software package «Expert Choice." Pproposed to use the partial indicators that are included in each criteria as a undercriteria.

The results of using the method of hierarchy is shown in the relevant gradient diagrams. The analytic hierarchy process allows to determine the priority of investing in innovative projects depending on the results of the company for a certain time (Figure 5).

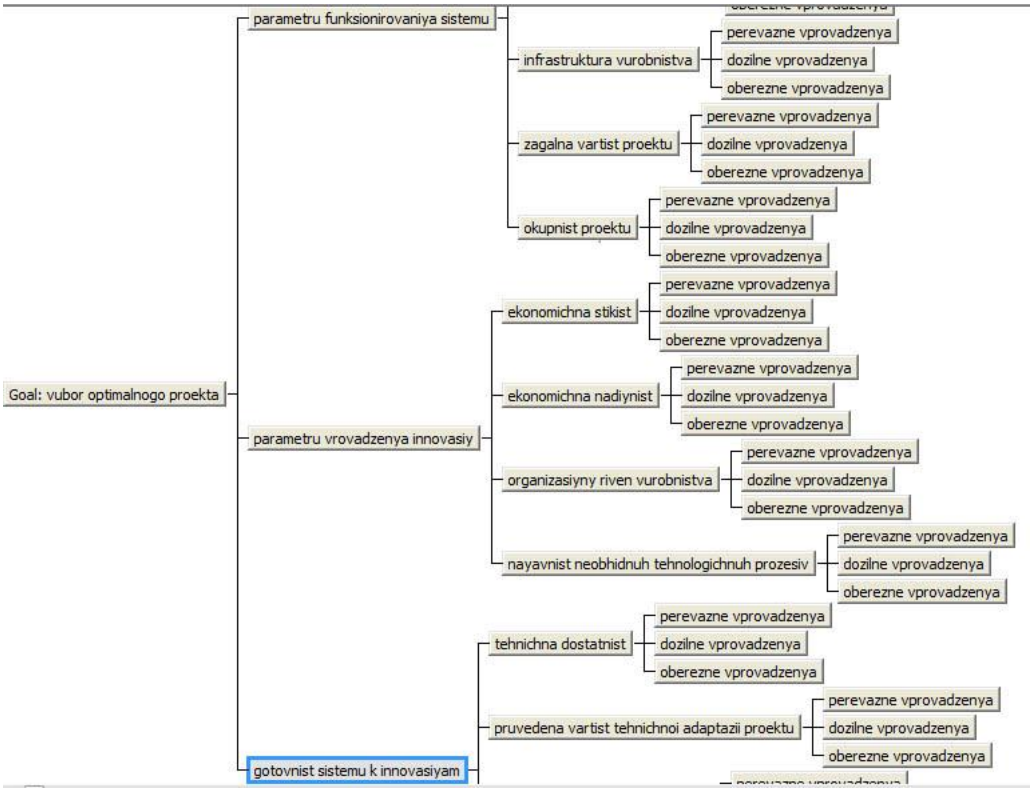


Figure 5. **Listing of hierarchies tree of investments efficiency for innovative development with the use of method «Expert Shoice"**

As an alternative proposed to choose investment option sequences of innovation development: 1) The primary investment; 2) Appropriate investment; 3) Careful investment. Further study of the sequence of innovative investments by using pairwise comparison under "Parameters of the system functioning "; " Parameters of innovation implementation"; "Readiness of the enterprises to implement innovations", and comparison of criteria among themselves by a ten scale table.

The results obtained in the pairwise comparison during selection of the innovative project are: within the first criterion that characterizes the system, the highest value on a scale have 2 criterias - "Technical security" (the degree of influence - 25%) and "Payback of innovative project "(the degree of influence - 49.8%) for the criterion "Parameters of innovation implementation" - "presence of the necessary processes" (the degree of influence - 59.3%), the criterion " Readiness of the enterprises to implement innovations" - "The level of quality of staff" (the degree of influence - 64.4%) (Figure 6).

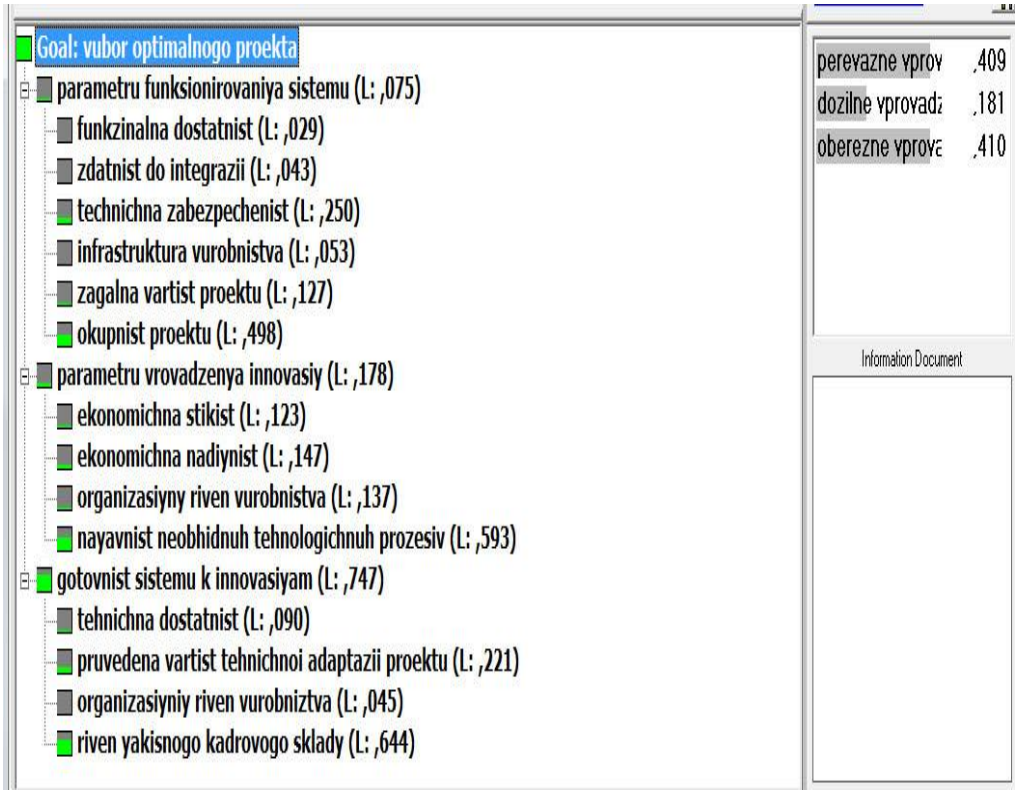


Figure 6. **The resulting tree hierarchy of the effectiveness evaluating, method of «Expert Choice"**

Example of pairwise comparison of criteria for evaluating the effectiveness of investment in innovative development of SME shown in Figure 7.

Figure 7. **Pairwise comparison of assess criteria of the effectiveness of innovative investment within criteria "Innovation parameters", method «Expert Choice"**

The results obtained in the comparison of criteria for evaluation of investment attractiveness among themselves on a scale of intensity shown in Figure 8.

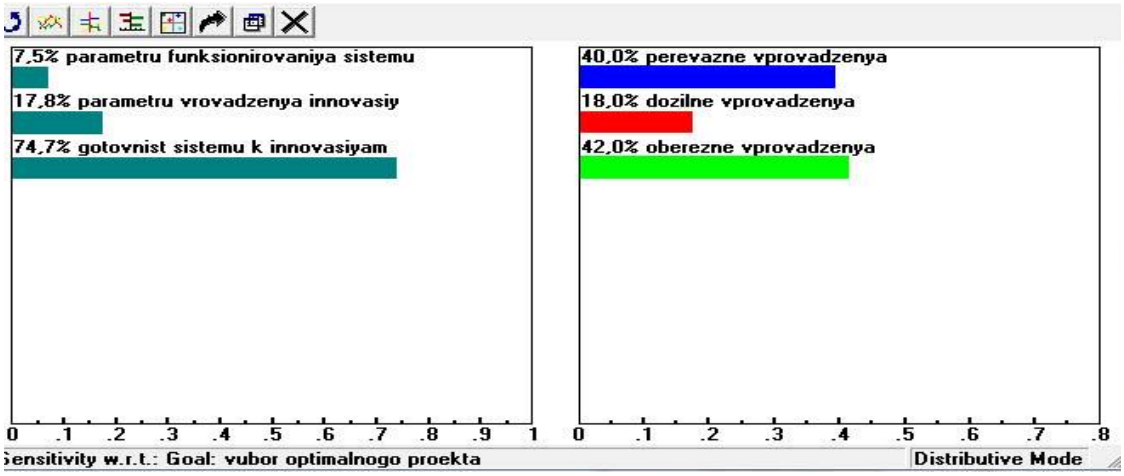


Figure 8. **Comparison of criteria and assess of the effectiveness of investment in innovation development, method «Expert Choice"**

In figure 8 greatest importance on a scale of intensity has the criteria "Readiness of the enterprises to implement innovations" (74.7% impact). The last two criteria - "Parameters of innovation implementation" (17.8% impact) and "parameters of the system functioning" (7.5% impact) - have no significant impact on the rationality for the choice of investment. Overall results for the alternatives - Investment options are shown in Figure 9.

Figure 9. The equity ratio of alternative investments, method "Expert Choice"

In accordance with the results of using the method «Expert Choice», the following conclusions can be made: for the triad innovative development in order to achieve optimum efficiency of investments required the use of its overwhelming form; priority of investment options is divided as follows (Table 3):

Table 3

Priority of investment options

Priority of implementing innovation projects	Place by priority	Specific weight
The primary	2	0,400
Appropriate	3	0,180
Careful	1	0,420

Calculated with the software «Expert Choice»

The primary investment takes place in conditions of 90% using of criteria "Parameters of innovative project implementing", as evidenced by the consistency of expert opinion. According to the results, the primary investment is appropriate for the maximum value of criteria "Parameters of implementing innovative project" (the share of all other components - 95%) and "parameters of the system functioning" (share - 74%). Careful investment is possible for maximum value of the criterion "Readiness of the enterprises to implement innovations" (share - 66%). Expedient investment is possible with identical values of three criteria: "Parameters of the system functioning" (share - 28%); "Readiness of the enterprises to implement innovations" (26%); "Readiness to implement enterprise innovation" (24%). The last option of determining the effectiveness of investment using two-dimensional matrix coordinates "Parameters of implementing innovative project" / "Readiness for implementing innovations" (Figure 10) allows to determine that the higher parameter of innovation implementation is - the more reasonable it is to consider for implementation (from "cautious" to "preferred").

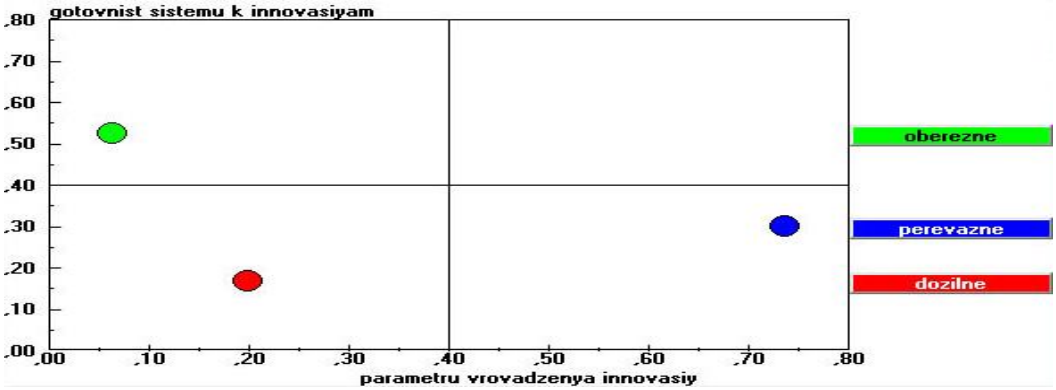


Figure 10. **The effectiveness of investing in the coordinate system "Parameters of implementing the innovative project" / "Readiness for the implementation of innovation", method "Expert Choice"**

Thus, the proposed method of evaluating the effectiveness of investment in innovation projects in the innovative development of the formed triad and interaction between public, private and high-tech sectors aimed at selection of optimal investment options based on a combination of key points - criteria: creating the conditions for innovation implementation; the reliability of the system; readiness to implement innovations.

Conclusions. In this article formed ways of activation of innovative development policy of the format of public-private partnership on the choice of priorities of innovations. As part of this collaboration, activated organization of technology transfer through direct transfer of intangible technologies (R & D) from science to industry (and vice versa), or the creation of new technology companies, initially targeting the introduction of their high quality new development and later integration of industrial and research structures (creation of innovation clusters). Formed the model of interaction between public and private high-tech sectors as a part of innovation clusters, which, unlike the known structure determines the relationship of the levels of management and resource allocation between cluster members, including innovative projects between developers and their customers,

which enables implementation of all stages of the innovation chain. Shown economic and organizational levers of state influence on the policy of innovative development, based on the use of bipolar approach to the interaction of the model to the corporate cluster type triangle - on the one hand, by integrating them with the aim of innovation development, upgrade technological equipment, attract additional financial resources, minimize internal risks and save costs associated with commercial activities, and on the other - deepening specialization of production and the formation of investment attractiveness.

References

1. Ajrapetyan M. S. Zarubezhnuj oput ispolzovanyya gosudarstvenno-chastnogo partnerstva: [Foreign experience in the use of public-private partnership]. Gosudarstvennaya vlasti mestnoe samoupravlenie, 2009, #2, 67-69 [in Russian].
2. The Law of Ukraine "On Public Private Partnership» №2404-VI of 01.07.2010. - Law League [electronic resource] – Retrieved from: http: // www.liga.net.
3. The Law of Ukraine "On Principles of Regulatory Policy in Economic Activity" of 11.09.2003 № 1160-IV: [electronic resource] - Retrieved from: http: http://zakon.rada.gov.ua.
4. Brusser P. A. Fynansovie modely y osnovnie fynansovie ynstrumenty HChP: [Tekst] [Financial models and the main financial instruments of PPP] / P. A. Brusser, 2013 – 400.
5. Innovatsiyna stratehiya ukrayins'kykh reform [Tekst] [The innovative strategy of Ukrainian reforms] / A. S. Hal'chyns'kyy [ta in.]. - Kyiv: Znannya Ukrayiny, 2002 - 336 - Bibliohr.: 322-336.
6. Mekhanizm rozvytku innovatsiynoho potentsialu klasteroob`yednanykh pidpryyemstv [Tekst] [The mechanism of development of innovative potential of cluster enterprises]: monohrafiya / M. M. Yermoshenko, L. M. Hanushchak-Yefimenko. – Kyiv: Natsional'na akademiya upravlinnya, 2010 – 236.
7. Nort D. Ponymanye protsessa ekonomycheskykh yzmenenyy: [Tekst] [Understanding the process of economic changes] / D. Nort ; [per. s anhl.] – M. : Vysshaya shkola ekonomyky, 2010 — 256.
8. Orhanizatsiyno-ekonomichni aspekty innovatsiynoho onovlennya natsional'noho hospodarstva [Tekst] [Organizational and economic aspects of the innovative renewal of the national economy]: nauk. monohr. / [M. M. Yermoshenko, S. A. Yerokhin, V. M. Shandra ta in.; za nauk. red.: M. M. Yermoshenko, S. A. Yerokhin]; Nats. akad. upr. – Kyiv: Nats. akad. upr., 2008 – 213.
9. Udoskonalennya rehulyatornoho seredovyshcha yak peredumova dlya zaluchennya investytsiy v ekonomiku Ukrayiny [Tekst] [Improving the regulatory environment as a precondition for attracting investment in Ukraine economy]: materialy Kruhloho stolu / uporyad. L. I. Vorotina [ta in.]; Yevropeys'kyy un-t. - Kyiv: Vydavnytstvo Yevropeys'koho un-tu, 2007 – 132.
10. Shumpeter Y. A. Teoryya ekonomycheskoho razvytyya. Kapytalyzm, sotsyalyzm, demokratyya : [Tekst] [The theory of economic development. Capitalism, Socialism, Democracy] / Y. A. Shumpeter. – M.: Eksmo-Press, 2008 – 864.
11. Aghion P., Howitt P. A Model of Growth through Creative Destruction // Econometrica, 1992, V. 60. P. 323.