

participating in international organizations do not provide timely and complete information.

Thus, the economic development of countries implies such changes that meet the interests of the majority of citizens, promote the quality of their lives, and allow them to confidently look into the future for a long time.

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FEATURES OF FINANCING OF THE INNOVATIVE-ORIENTED STRUCTURES USING MECHANISMS OF THE PUBLIC-PRIVATE PARTNERSHIP

Summary. The aim of the publication is to study and generalize theoretical and methodological principles of the implementation of the public-private partnership (PPP) for activity of scientific innovative-oriented cluster type structures (SIOCTS) in the scale of the national economy and the development of the recommendations for the formation, practical use, and further improvement of the mechanism of its

regulation. Propositions are based on China, France, India, Indonesia, Japan, Malaysia, Singapore, South Korea, Thailand, United Kingdom experience. Modernization of the development of the PPP projects for SIOCTS in the increasing challenges of globalization and increasing international competition, based on the strategic lines of the development of the similar international models should be based on the following principles: clarifying the essential characteristics of the PPP projects with all of the functioning of the national economy; rationalization of the national model of the public-private partnership; updating the list of purposes of implementing the PPP policy; expanding of the list of economic activities that are within the practice of implementing cooperation agreements; expanding the list of species of legal registration of transactions; review of approaches to expand the list of entities that can initiate the conclusion of the partnership agreements; expanding and refining the content of individual stages of the implementation of the PPP; improving the current legislation on the regulation of the PPP; expanding the empowerment of parties involved in the transaction; improvement of tools and techniques of risk management transactions of the PPP; development of an effective mechanism to guarantee the return of invested funds of agreements on cooperation of PA and private business; organization of constant monitoring of the PPP projects; development of the implementation mechanism “unsolicited proposals” for cooperation. Acting mechanism of the PPP regulation in Ukraine in the sphere of SIOCTS functioning is influenced by the characteristics of all risk factors countries and failure of parties of the partnership because of agreements of economic interests. Since the regulation of economic development, including the region of the state, pursues the goal of fulfilling of vital needs of both sides of the partnership, which are in commercial relations and all public stakeholders, preliminary examination of the partnership projects should include mandatory cash flow calculations and social indicators of the investment projects of the PPP; similar codes on the stage of determination of indicators of the commercial efficiency; cash flows in the case of budget efficiency assessment of the PPP projects.

Introduction. Global socio-economic transformations and the development of the market relations in Ukraine raise the question of transforming the role and place of the state, its main partner – private business, the use of hybrid forms of their cooperation in the functioning of a market economy, especially at the regional level. Despite global institutional reforms, the Ukrainian state continues to act as the main subject of the regulation (mainly by means of the economic influence) for the clear majority of spheres of society’s life. At the same time, it clearly manifests the objective need for an active and effective influence of intervention into the production processes of the stakeholders, public organizations of entrepreneurs and employers, creating a complete system of public-private partnership (PPP) in the field of innovation.

In the writings of J. Keynes, M. Blaug, Paul Samuelson, P. Drucker, M. Porter, the fundamental theoretical approaches to the development of the PPP are developed, models, forms, and mechanisms of the productive cooperation of state governance and business innovation sector are tested. The issues of the interaction between state and small business, the formation and activities of its corporate unions are the most thoroughly investigated. Especially we note the significant contribution of well-

known researchers as A. Akintoye [1], B. Flyvbjerg [2], D. Helm [3], G. Hodge [4], T. Merna [5], E. Savas [6], G. Teisman [7], R. Vickerman [8] et al.

Problems and prospects of the formation of the PPP are highlighted in the works of Ukrainian scientists: B. Vynnytskyi [9], V. Heiets [10], B. Danylyshyn [11], K. Pavliuk [12], P. Shylepnytskyi [13]. However, despite the numerous studies, the problems of adaptation of the best practices in using the PPP tools during the organization of the activity of the competitive innovation-intensive enterprises, which not only seek but also have all the grounds for the successful integration into the globalized space of the post-industrial economy, remain insufficiently highlighted.

The main result of carrying out research and development works (R&D) in modern conditions are the innovative products, which, because of the complex activities on their creation, use, and distribution in the sectors of the national economy, turn into innovations – competitive technologies, products or services of production, administrative, commercial or otherwise.

The most economical and time-consuming way of implementing a cycle of transferring innovative products to profitable use in the real economy is the introduction and organization of the activity of the innovative-oriented cluster type structures (IOCTS).

1. Organization and financing of the IOCTS activity

IOCTS is a production and consumer complex formed based on the territorial concentration of the specialized suppliers, producers, and consumers of products/services related to the technological chain or a virtual structure created based of the formation of the innovative networks and not geographically linked to a separate territory.

The sequence and peculiarities of the individual stages of the life cycle of innovations – from (a) the emergence of the idea in the environment of generation and transfer of knowledge; (b) the introduction, production, and profitable commercial realization of the innovations in the real sector of the economy; (c) the regulation, control, and stimulation of the innovation activities by public administration (PA), (d) the promotion, diffusion, and use of the innovative product with the fully satisfy demand for active consumers and its next transformation into routine, form a set of mandatory and necessary elements of IOCTS.

The mentioned form of management of the innovative activity in the most effective way contributes to the emergence of a synergistic effect based on the pooling of efforts and competences of its participants (enterprises, research and educational institutions, state authorities, service companies, intermediaries, etc.), which operate for the creation, introduction, and commercialization of the innovative product to achieve competitive advantages in the market.

Industry IOCTS (IIOCTS) is an economic system that is a set of enterprises, organizations (production, service, universities, research institutes, engineering centres, innovators, technology, market institutions, consumers) that are located on the same territory, interact with on a contractual basis (cooperation agreements) do not undermine the rights of any of its members, work towards the same goal – to achieve the economic growth in the process of using innovations, characterized by certain stability that creates and engage participants provided a synergistic effect.

Territorial IOCTS (TIOCTS), unlike the territorial-production complex (TPC) as the main form of spatial organization of the production activities for the dominance

of the economy on scheduled basis, are constantly evolving way of forming value chain by forming a cluster around an innovative core (innovation active enterprise or scientific institution) to increase the prosperity/competitiveness of the region [14].

Scientific IOCTS (SIOCTS) – classified on the basis of the integration of the vector orientation, geographic location, and degree vector combining innovative system of economic agents are able to regulate and control the process of commercialization of science in higher education, including the learning of future innovative specialist type of economically active structure that operates on the basis of a particular university, an investment project of socio-economic type, which provides justification of the economic feasibility of investments in order to achieve the enumeration of academic and non-academic results [15-17].

A fundamentally important issue for the functioning of IOCTS in Ukraine is the financing of their activities.

Public funding previously mentioned TPC based on software basis method of forming energy-chain cycles to minimize production costs, made at the initiative of the central government, which form the state order. It is to obtain a regional effect from the concentration and specialization of enterprises by central government bodies providing free and irrevocable provision of budget funds to state agents.

The procedure for funding production activity is significantly complicated in a modern economy. The general principles of financing state and municipal expenditures in the conditions of equal coexistence of institutional entities at all levels of the national economy are: planning; compliance of planned expenditures with the amount of state or municipal revenues; target allocation of funds; compliance of expenditures financed with the rights and interests of citizens, organizations, state, municipalities protected by current legislation; the compliance of the expenditures financed with the requirements of environmental, sanitary and hygienic and other statutory and corresponding norms; free and non-refundable funds allocated; control over the use of state and municipal funds and liability for offenses in this area.

The legal regime of financing (depending on the use of entities) are: securing property for state and municipal commercial organizations on the right of economic management; budget financing of state and non-profit municipal institutions, which were granted the right to operational management of the property.

Funding IOCTS is a dynamic process of attracting, accumulating, and using financial resources aimed at developing, implementing, and commercializing innovations to provide strategic objectives for the functioning of the cluster. Funding principles of IOCTS are subdivided into traditional ones – purposefulness, financing as the work is done (provision of services), compliance with financial discipline; as well as specific, which reflect the features of the innovation cluster – synergy, targeting, flexibility, differentiation. The complication of the principles of investing in SIOCTS manifests itself in a clear demarcation of their social and economic varieties.

The social objectives of the investment are to ensure the educational and scientific integration of the economic agents in the field of higher education and science, the activation of the social elevator for gifted university entrants, students, graduates of higher educational institutions – residents of SIOCTS, integration of university and state innovation policy aimed at increasing opportunities for the education of the innovation type, and as a consequence, the commercialization of science in higher education.

The economic principles of investment of funds are multichannel and differentiated investment attraction, provision of organizational development of the innovation structure as a form of the integration of the university science to national and regional innovation systems, maximization of the positive effect, achievement of a competitive level in the innovation sphere, development of production cooperation between the participants of the SIOCTS, as well as their integration to the international scientific-production chains that are formed within the framework of the functioning of specific technologists platforms.

The model of financing of the innovation process is realized in the process of circulation of funds and diffusion of innovations between residents of SIOCTS – producers of innovations; financial suppliers; PA; innovative active commercial enterprises; consumers of products (Fig. 1).

If the concluded matrix of estimation of separate leaks of funds with the coordinate axis “source of financing – level of accessibility, capacity, cost of attraction, level of risk” demonstrates the degree of suitability of the external revenues for the use in the financing process of SIOCTS, then formal warnings impose restrictions on variants of the use of means of production enterprises in the process of passing stages of the life cycle of the innovative products.

2. International PPP experience in the innovation activity

The management of the economy from the side of PA is carried out through the regulatory influence on the system of relations between the regulators (state – corporations – public unions of entrepreneurs and industrialists – consumers of goods and services) that interact within a limited economic space to realize the goals and conditions of social production. If in the process of regulation, the question arises of the need to combine the material and intangible resources of society (in the person of the PA), as well as private business funds for creating public goods or providing public services, then, under the current conditions of the development of the national economy, this occurs mainly in the form of PPP.

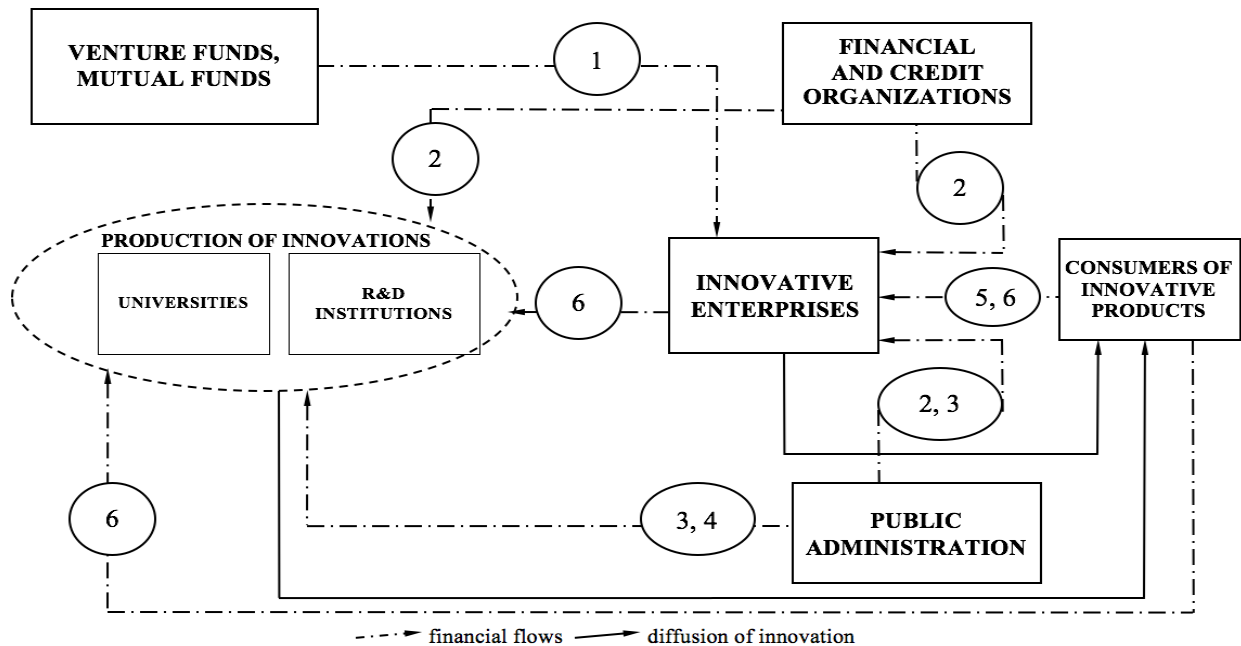
From the point of view of the objective of the study, we will define the essence of the category “the mechanism of the regulation of the PPP in the innovation activity” as an ordered system of administrative measures of the PA on the complex of mutually beneficial relations between representatives of the authorities, business, civil society institutions, local communities on the redistribution of powers in the field of production of the innovative goods and provision of the innovative services, which at present are mainly carried out by state enterprises and institutions.

Effective use of the PPP mechanism ensures optimal coordination between the parties to a wide range of issues: the sharing of responsibilities, risks, obligations regarding financial security, design, construction, operation, ownership, participation in management, and distribution of profits.

Due to the direct and indirect influence of several reasons of legal and organizational nature, the list of the applied PPP models in Ukraine, as compared with international practice, is significantly narrowed.

It is limited with contracts for technical services, social services, government assets, and contracts of cooperation of the simplest type, lease agreements with lease payments to the state, concessions, infrastructure development, and the provision of services within the corporate responsibility of corporations. The international experience of using the PPP models in comparison with domestic ones is much more

significant and extends to a much wider list of infrastructure objects. In view of this, we consider it necessary to introduce into the practice of domestic PPP regulation the international experience of cooperation between the PA and private investors, which provides for a few measures to reform it.



Notes: 1 – participation in the statutory fund through the purchase of shares; 2 – credits; 3 – subsidies; 4 – grants; 5 – issue of bonds; 6 – licensed payments from transferred rights for the use of intellectual property

Source: adapted by the author based on [18]

Fig. 1. The financing model for the innovation process within the framework of the SIOCTS

China. The existence of fundamental differences in the meaning of the coefficients of financial self-sufficiency, the sequence and the content of the technological processes and other operational-design characteristics cause significant deviations in the process of forming the PPP models in various areas of application of the partner relationships.

Thus, in the water supply sector of the national economy, different tariffs are used to pay for purified water and to compensate for its total consumption. Ultimately, water supply companies receive funds from the PAs only for purified water, and the authorities themselves collect funds from end users at a slightly higher rate. Thus, the treatment plants are transferred to the private business with schemes BOT (build – operate – transfer) or TOT (transfer – operate – transfer). BOT schemes are the most popular model for toll roads, where private investors are directly receiving revenues from users. Incidentally, this means that it is the private business that puts the risks of organizing traffic and related revenues. The peculiarity of the Chinese experience modelling of the PPP is to spread these kinds of as SBOT (subsidies in build – operate – transfer) and BSOT (build – subsidies in operation – transfer).

Despite the proliferation of the PPP models in most areas of infrastructure construction, there is still the lack of a perfect national base for regulating such partnership issues as project evaluation, procurement organization, decision-making processes, public accountability of partners, fair sharing of risks between them, and tariff adjustments in China [19; 20].

France. The economic crisis of 2007 led to the need to formulate a new role of private finance in overcoming its consequences [21; 22]. The material basis of the state support of the PPP is announced three key elements: budget guarantees in the amount of 10 billion euro; budget expenditure on the formation of long-term loans in the amount of 8 billion euro managed through public savings banks (Caisse de Dépôts); the new legislation of 2009 is intended to accelerate the implementation of the PPP program especially by safeguarding the protection of private business interests in the partnership process. Another initiative of the President of the republic is to declare a “big loan” program with a budget of 35 billion euros, of which 22 billion is provided by financial markets. In the plans of providing an investment of 60 billion euros in four priority areas: higher education and research (R&D) (additional university funding with program “Plan Campus”), industry, renewable energy, digital economy [22].

India. The PPP projects are defined by the government as such, based on contract or concession between PA and by the private sector to investments in the construction and maintenance of infrastructure assets and/or services infrastructure. In this case, the PPP projects involve the transfer or lease of state assets.

Institutional mechanisms for promoting PPPs are designed to maximize their role in the development of the national economy of India [23; 24]. This is supported by important political initiatives of the Government, consisting in implementing the activity of the PPP Appraisal Committee (PPPAC) – an institution whose main objective is to promote the development and implementation of the PPP projects; India Infrastructure Finance Company Limited (IIFCL), companies for the promotion of the inflow of long-term investments in the national economy (NE); India Infrastructure Project Development Fund (IIPDF), whose vocation is to cover a part of the costs in the development of the PPP projects.

Indonesia. The role of the government of this country in the provision of infrastructure services has long been significant enough [25; 26]. The Government continues to play a central role in the development of the policy and effectively monitor the implementation of the PPPs through a system of government bodies such as the National Planning Agency, KKPPI, IIF, and the Ministry of Finance. Although private businesses account for about 69% of Infrastructure projects in Indonesia, PAs remain key players in infrastructure development. One of the most vulnerable aspects of the implementation of the PPP projects in Indonesia is the lack of the effective evaluation and monitoring procedures.

Japan. The use of private financing for public services is one of the priorities of the development of the national economy of Japan [27; 28]. In 1980, when there was significant state budget deficit, the model of the “third sector” was used to ensure a broad access to private capital as a resource for additional funding of public projects. Due to some problems, especially around risk sharing, updated PFI model is designed to provide access to the PPP contracts for private capital, which will be defended in matters of equitable sharing of risk between the public and private sectors. Actively used, dominant today the model of PFI “Hakomono”, provides the execution of the single obligations to stakeholders, entitled “value for money”. Instead, the government’s efforts today are designed to provide real cost of PFI (Private Financial Initiative). Today we note the four major areas of reform policy approaches to the PPPs in Japan: first, a departure from traditional models “hakomono”, refocusing on the model concession cooperation; secondly, the focus is shifting to the analysis of the ratio of “price-quality” by improving the operating characteristics of the PPP

projects, the attention which was insufficient; thirdly, measures to ensure the comprehensive cost reduction agreements in force revision policy in public procurement, i.e. “policy of the PFI without SPS” (Special Purpose Company); fourth, the formation of a proper understanding of the financial model of private initiative, which should eliminate the potential risks that may be caused by the opportunistic behaviour of private companies.

Malaysia. The feature of the Malaysian model is that it began and continues to consist of two main components – namely privatization and PFI. The first of these was implemented in 1983 and the last one – in 2006 [29]. Timing PFI and PPP (public-private partnership) in this country are often used interchangeably. PPP is carried out on a systematic basis, including through a five-year strategic plan for development.

Singapore. Overall, Singapore has very favourable conditions for the implementation of the PPP projects [30; 31]. However, the presence of barriers (six basic varieties) – social, political and legalization risks; adverse economic and business condition; inefficient public oversight procedures; lack of sophisticated financial engineering techniques; the problem of relations with the public sector; problems relations the private sector – delays the process of full implementation of mutually beneficial contracts. A unique feature of the implementation of the Malaysian model of the PPP is its absolute efficiency for private business and the lack of enforcement interests of the public (state) sector. This, in part, may explain the absence of central authority partnership settlement.

South Korea. In terms of population aging, while expenditure on maintaining a proper level of spending on welfare is steadily increasing, there is a restriction of public investment in infrastructure [32; 33]. Thus, the government is actively promoting private investment in areas where the use of resources of private enterprise can effectively and competitively supplement budgetary costs. Meanwhile, the use of the PPP projects is prevented, firstly, with temporary difficulties in adapting national accounting with International Accounting Standards. Second, the super-fast growth of the aging population, coupled with low birth rates, a consequence of the reduction of the working age population.

3. Modernization of funding IOCTS using the PPP mechanisms

Currently, there is no single definition of the PPP, which would have universal spread around the world and could be used without warnings in all possible areas of cooperation between the state and private business.

Universally suitable for the practical use in consideration of the specifics of Ukrainian legislation is the United Kingdom PPP model. It should be noted that despite the relatively low level of the investment PPP projects involving private business, the country’s Treasury Department constantly improves the procedures of the PA cooperation with these institutions.

In the United Kingdom, the PPP is defined as an agreement on cooperation between the public and private sectors. In the broadest sense, it covers all kinds of cooperation carried out by the interface between sectors to joint activities and sharing risks in the implementation of policies, services, and infrastructure. The most common type of the PPP is a private financial initiative (PFI). PFI is an agreement under which the public sector is committed to providing its inherent services using

investment in assets received from the private sector on a long-term basis, over a long period (15 to 30 years).

Per the latest trends of the research in this area, promising recognized are such forms of cooperation, in which the public partner on a competitive basis with the private concludes an agreement for the design, construction, and operation of the facility throughout the lifetime service project pays instalments only after its introduction operation on condition of maintaining the private partner object per specific functional requirements [34].

Attracting investment funds is regulated by analogy to blending structural and investment funds of the PPP projects developed by the European Examinations Centre [35].

A new approach to the PPP defines government policy to attract private capital in public infrastructure service on basis of delivery through long-term contractual arrangements PF2, which significantly modernized traditional approach PFI (Private Finance Initiative) and related issues:

- universal growth of partnerships between the public and private sectors provided with the memorization of government equity participation in projects in the PPP in terms of PF2;
- speeding up and reducing the costs of the PA by:
 - improving procurement opportunities for the public sector by strengthening the mandate of infrastructure support departments with centralized procurement;
 - time limiting of the competitive phase of bidding for projects PF2 for term not exceeding 18 months;
 - introduction of a standardized and efficient approach to procurement procedures and providing the complete set of standardized documents;
 - strengthening of drafting the study by introducing additional checks on the part of the Treasury Department at the stage of preliminary procurement;
- improving service delivery flexibility by:
 - removing “soft” services (cleaning and meals) project;
 - introducing greater freedom of handling volumes of maintenance work at the beginning of the project and the possibility of adding or removing optional services during operation of the project;
 - periodic reviews of the level and quality of service;
- transformations of the process to ensure transparency by:
 - implementation management process for all liabilities arising in the implementation of off-balance sheet (accompanying) contracts;
 - organization of mandatory publication of information on private sector equity participation in projects PF2;
 - publishing an annual report detailing the project and financial information on all projects where the government will keep a controlling stake in the public sector;
 - introducing the list of concluded business agreements on the website of the Treasury;
 - the introduction of the mechanisms to regulate the funds to support the provision of services during its life cycle;
 - improving information within the standard support moves projects;
- improving value connotation “value for money – risk-sharing” agreements PF2 by:

- strengthening the management of individual species risks on the part of the PA, for example, the risk of additional capital expenditures arising from unforeseen general changes in legislation;
- amendments to existing regulations, which implement risk-sharing mechanisms indemnified for the necessary operational phase of projects;
- expanding the list of sources of debt and equity funding through:
 - competitions to attract long-term investors before the financial closure phase of projects;
 - promoting the use and quality assessment procedures different sources of debt financing, including public and private bonds, borrowing commercial banks, multilateral debt products;
- ensuring the highest quality of the money received infrastructure services their users during the replacement of the status of the evaluation of the partnership [20].

In the fully advanced requirements to the model PF2, moreover, adapted to the specific national legislation on the PPP corresponds to the model of “mixed contract life cycle”, in contrast to the traditional “contract life cycle” – modification of PFI, which is analogous DBFO (Design – Build – Finance – Operate) of the PPP, involves its use in the composition of “mixed structural and investment funds”, the usage of which are the prevailing in EU during the programming period of 2014–2020 [36].

Content DBFM can be defined as a form of contractual PPPs, in which the public partner on a competitive basis with the private conclude an agreement for the design, construction, and operation of the facility throughout the life cycle of the project pays equal instalments only after its commissioning on condition of maintaining the private partner facility in accordance with the specified functional requirements.

Thus, the private partner assumes all design and technical solutions and related risks. Unlike BFM model, the question of financing the first stage of the project lifecycle within SIOCTS functioning does not rely solely on the private partner, who is forced in this case to involve special project company.

The introduction of the mandatory procedures for monitoring the implementation of the PPP in the case of traditional and updated models of the partnership proposed to implement the algorithm that provides a consistent flow stages:

- (1) evaluating current performance indicator implementation compared to its target value;
- (2) setting needs for regulatory impact;
- (3) analysing the reasons for rejection method and making choices of the method of impact on the value of the index;
- (4) The adjustment parameters and conditions of the contract; change if necessary scheme of the project; change if necessary forms of interaction partners;
- (5) calculation of performance goals, considering changes made.

The object of monitoring is the indicator of the efficiency of the PPP or their discounted value [36-38].

Conclusion. Modernization of the development of the PPP projects in the increasing challenges of globalization and increasing international competition, based on the strategic lines of the development of the similar international models should be based on the following principles: clarifying the essential characteristics of the PPP projects with all of the functioning of the national economy; rationalization of the

national model of the public-private partnership; updating the list of purposes of implementing the PPP policy; expanding of the list of economic activities that are within the practice of implementing cooperation agreements; expanding the list of species of legal registration of transactions; review of approaches to expand the list of entities that can initiate the conclusion of the partnership agreements; expanding and refining the content of individual stages of the implementation of the PPP; improving the current legislation on the regulation of the PPP; expanding the empowerment of parties involved in the transaction; improvement of tools and techniques of risk management transactions of the PPP; development of an effective mechanism to guarantee the return of invested funds of agreements on cooperation of PA and private business; organization of constant monitoring of the PPP projects; development of the implementation mechanism “unsolicited proposals” for cooperation.

Acting mechanism of the regulation of the PPP in Ukraine in the sphere of functioning SIOCTS is influenced by the characteristics for all risk factors countries and failure of parties of the partnership because of agreements of economic interests. Since the regulation of economic development, including the region of the state, pursues the goal of fulfilling of vital needs of both sides of the partnership, which are in commercial relations and all public stakeholders, preliminary examination of the partnership projects should include mandatory cash flow calculations and social indicators of the investment projects of the PPP; similar codes on the stage of determination of the indicators of the commercial efficiency; cash flows in the case of budget efficiency assessment of the PPP projects.

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