

## **Public-Private Partnership Projects as a tool for Developing Social Infrastructure<sup>1, 2</sup>**

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### **Abstract**

The main goal of Public-Private Partnership (PPP) projects in the creation, reconstruction and operation of social infrastructure facilities is to create conditions for the development of human capital, a healthy lifestyle, comfortable living, etc. The sectoral structure is examined and perspective directions of PPP projects in social infrastructure were revealed. The main organizational and legal forms of PPP projects in social infrastructure are researched (Concession, PPP agreements, quasi-PPP etc.). The goals, interests and benefits of the project agreement participants are analyzed.

The conclusion is made about highly risky nature of PPP projects. One of the most important issues in the process of developing and implementing a PPP project is the identification and distribution of risks and responsibilities between public and private partners, since risks can lead to changes in the project parameters and conditions for its implementation. The classification of PPP project risks in social infrastructure is carried out typical for all investment projects; typical for PPP projects; typical for projects in social infrastructure. It is shown that public and private partners use different methods of risk assessments of PPP projects in the social sphere. The choice of the right decision to participate in the project is largely determined based on the risk analysis of the PPP project.

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It is recommended to use the "project finance" model of attracting financial resources more widely when implementing PPP projects in social infrastructure.

The main directions of effective state policy that stimulate the development of PPP projects in the social infrastructure are proposed.

**Keywords:** public-private partnership projects, infrastructure projects, social infrastructure.

**JEL code:** G11, O22

## Introduction

New economic and social challenges impose special requirements on employees in various sectors of the economy. Priority is given to such characteristics as professional competence, the ability to create innovations, and effectively manage them in a changing environment. All this defines a qualitatively new approach to human capital as the most important factor of sustainable development. In turn, the development of human capital associated with the level of education and upbringing, labor qualifications, health, mobility is largely determined by the quality of goods and services provided by social sectors (education, health, culture, physical culture and sports, tourism, social security, etc.). At the same time, the development of the social sphere is impossible without the availability of infrastructure facilities that meets modern standards.

The provision of social public goods and services to the population is a state function and requires a large amount of investments. An increase in their number and quality characteristics requires either an increase in government spending, or the use of new mechanisms to attract private investments in the social sector. In conditions of limited public resources, the mechanism of public-private partnership (PPP) becomes an additional source of financing of social infrastructure.

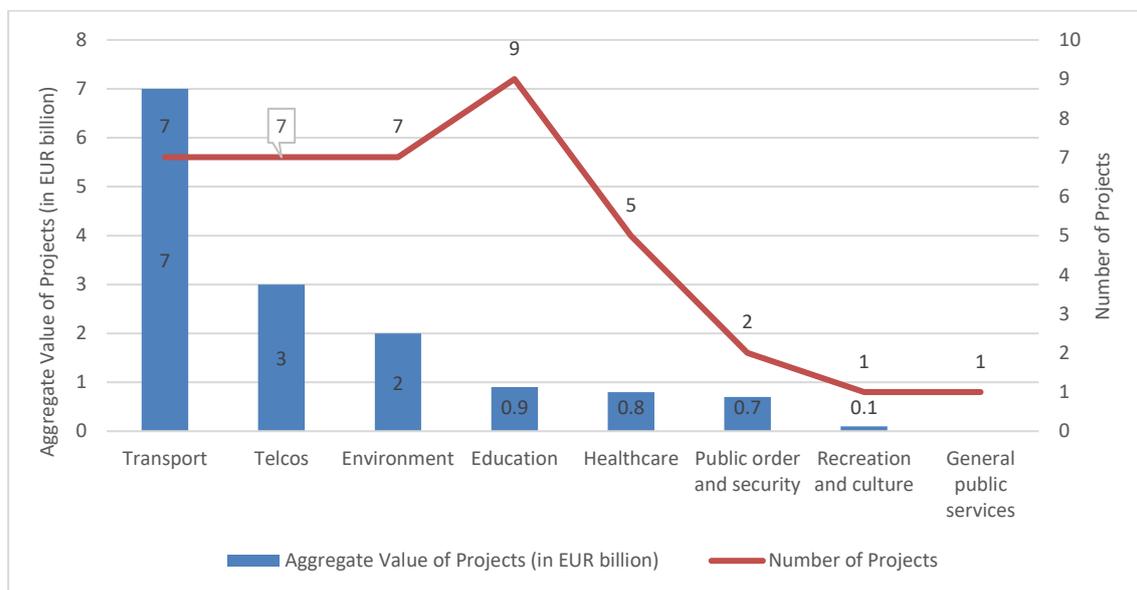
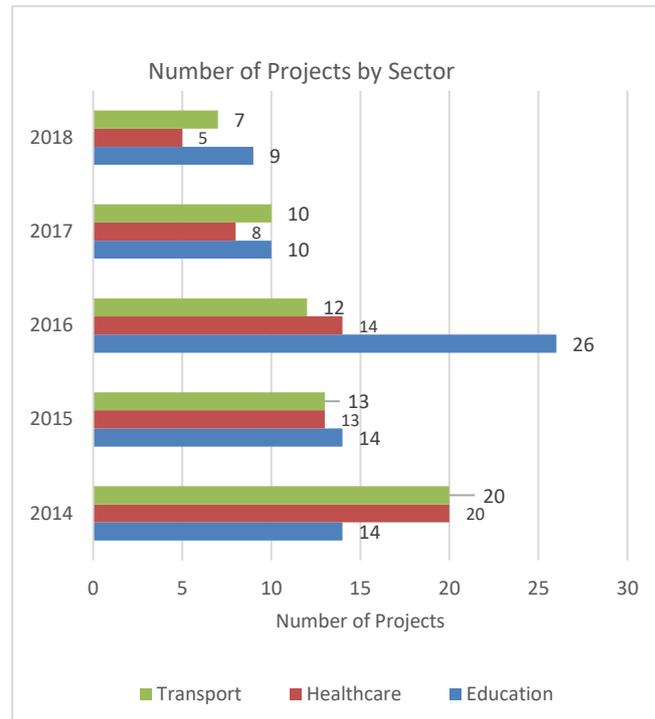
Scientists actively study the principles and forms of PPP in the modern economy. The greatest contribution to the study of these issues was made by scientists such as A.A. Alpatov, A.B. Atkinson, J. Delmon, E. Farquharson, A. Hirschman, V. A. Kabashkin, V.V. Knaus, V.V. Maximov, M. Porter, O. Solvell, J. E. Stiglitz, V. G. Warnavsky, E. R. Yescombe, A. G. Zeldner and others. We should note that the degree of elaboration of PPP issues in General is quite high. The works of these researchers reflect the theoretical aspects, organizational forms, and practical technologies of PPP implementation. However, the special role of social public goods and services, and the specifics of demand formation for them, make it necessary to clarify the mechanism for implementing projects aimed at creating, reconstructing and maintaining social infrastructure facilities based on PPP principles. All this determines the relevance, purpose and objectives of this study. The main methods of its implementation are analysis and synthesis, logical modeling,

economic and statistical analysis (grouping, classification, construction of dynamics series, graphic, comparative analysis).

### **Public-Private Partnership projects: industry analysis**

Projects, that are referred to as temporary enterprises formed to create unique products, services or results, are actively implemented in many areas of economic activity. Despite common management technologies, projects are significantly different. Therefore, the correct choice of project management tools makes it necessary to study the specifics of individual types of projects, which is determined by a set of certain factors (main goal, type, scale, duration, industry affiliation, complexity, ownership of project results, etc.) (Archibald, R. D. & Archibald, S., 2015; Beliakova, M.Y. & Yurieva, T.V., 2020, pp.35-37). At present, many important socio-economic challenges are being solved through the implementation of public-private partnership projects. PPP projects are projects that are carried out by the state and private organizations on objects of state property and property of local authorities in order to increase the availability of public goods provided to the population, as well as to increase their quality. PPP projects are an effective tool for attracting additional private investments in the economy, allowing you to use the best technologies of private and public partners (Delmon, J., 2015).

PPP projects are used to create, modernize, and maintain public infrastructure and provide vital services to the population. Many PPP projects contribute to the development of innovations, strengthening the position of national business in the global market, and forming the cultural image of the country and its individual regions. The main areas of implementation of PPP projects are: transport, telcos, environment, education, healthcare, public order and security, recreation and culture, general public services and etc. The sectoral structure of PPP projects in the European Union (EU) is shown on fig. 1.

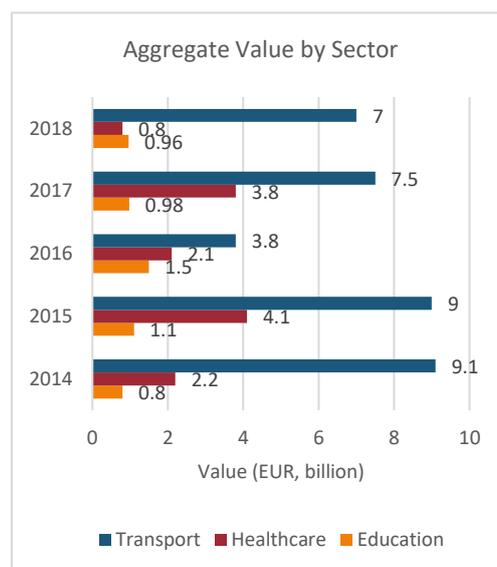


**Fig. 1. Number of PPP projects and their costs in EU industries in 2018**

Source: author’s construction based on European PPP Expertise Centre, 2018. Market Update Review of the European PPP Market in 2018. EPEC, p. 3.

The main goal of PPP projects in social infrastructure is the creating of conditions for the development of human capital, a healthy lifestyle, comfortable living, etc. Despite the fact

that education projects account for a significant part of the total number of PPP projects in the EU, there has been a recent trend towards a decrease in both quantity and value. For example, in 2018, the number of PPP projects that reached financial closure decreased from 14 to 9 projects in the education sector compared to 2014, and from 20 to 5 projects in the health sector. The decrease in the cost of projects primarily affected health care, from 2,2 to 0,8 billion euro (fig. 2).



**Fig. 2. Evolution of the Main PPP Sectors (2014-2018)**

Source: author's construction based on European PPP Expertise Centre, 2018. Market Update Review of the European PPP Market in 2018. EPEC, p.7

One of the most significant PPP projects in social infrastructure, which was signed in 2018, is the reconstruction of the campus of the Grangegorman University in Ireland. The main goal of this project is to create a single state-of-the-art campus with the Dublin Institute of Technology (DIT). The total area of the two buildings is about 52,000 square meters of academic space and is designed for 10,000 students and 600 employees. The building is planned to be put into operation by the 2020/21 academic year. In line with Ireland's strategic national priorities, the academic buildings will be provided with modern equipment, primarily for the colleges of science and healthcare, arts and tourism, and the DIT College of electrical and electronic engineering. In addition, this project corresponds to such tasks as more compact urban development; turning the Irish higher education system into one of the best in the world. The implementation mechanism of this project includes the design, construction, financing and maintenance of two educational buildings. European Investment Bank (EIB) funds the project in the amount of 110 million euros, MUFG, Sun Life Investment Management and Talanx Asset Management. The total cost

of the project is estimated at approximately 253 million euros (European Investment Bank, 2018).

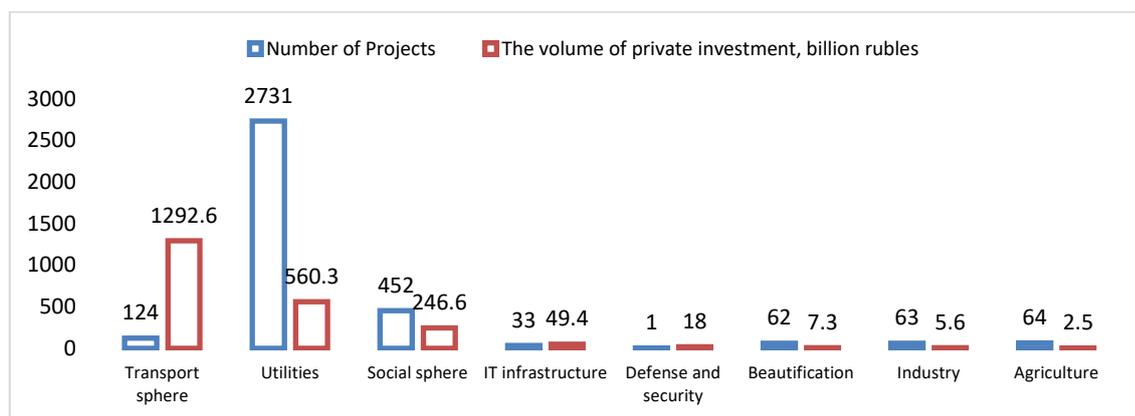
It is worth mentioning that significant parts of PPP infrastructure projects in the EU are implemented with the financial support of the EIB. In particular, this Bank in the period 2014-2018 participated in the financing of 16 PPP projects in the field of education and health, almost 70% of which were implemented in the UK. The EIB has allocated 1,769 million euros for this purpose (table1).

**Table 1: PPP projects in education and health, financed by the EIB in the years 2014-2018**

Year	Country	PPP Project	Sector	Amount инвестиций EIB (EUR million)
2018	Ireland	Grangegorman Campus	Education	110
2017	Austria	Campus Berresgasse	Education	21
2017	Turkey	Bursa Integrated Health	Healthcare	150
2016	Ireland	Primary Care Bundle	Healthcare	70
2016	Turkey	Gaziantep Health	Healthcare	120
2016	United Kingdom	Priority Schools Building Programme - Yorkshire	Education	72
2015	United Kingdom	Dumfries and Galloway Hospital	Healthcare	155
		Edinburgh Hospital for Sick Children and Clinical Neurosciences	Healthcare	112
		Midland Metropolitan Hospital	Healthcare	148
		Papworth Hospital	Healthcare	65
		Priority Schools Building Programme – North East	Education	65
		Priority Schools Building Programme - Hertfordshire, Luton and Reading		88
		Priority Schools Building Programme – North West	Education	69
		Priority Schools Building Programme – Midlands	Education	88
2014	Germany	University Hospital of Schleswig-Holstein	Healthcare	400
	Greece	Attica Schools (Bundles I and II)	Education	36

*Source: author's compilation based on European PPP Expertise Centre, 2019. PPPs Financed by the European Investment Bank from 1990 to 2018. January 2019.*

There were 3,700 contracted PPP projects in Russia in 2018, the total volume of private investments of which amounted to 2,182 billion rubles. In 2018, 353 PPP projects passed the stage of commercial closure. The amount of private investment directed to PPP projects increased from 247.5 billion rubles to 451.7 billion rubles. Private investors prefer to invest in large PPP projects that exceed 1 billion rubles. The average duration of PPP projects is 12 years. A significant part of PPP projects is implemented in the utilities, energy and social sectors (fig.3).



**Fig. 3. Sectoral structure of PPP projects by industry in the Russian Federation in 2018**

Source: author's construction based on National Center for Public-Private Partnerships, 2019. Simple and Honest about Investment in Infrastructure and Public-private Partnerships in Russia. Analytical Review. Moscow: National Center for Public-Private Partnerships, p.21.

In the social sphere, the majority of PPP projects are carried out in health and education, while there are far fewer projects in tourism, culture and cultural heritage. There are few PPP projects in the sphere of physical culture and sports, as well as social services for the population, PPP projects are conducted at all levels of management (federal/national, regional, municipal).

Federal / national PPP projects are aimed at integrated development of territories and creation of unique infrastructure complexes. In 2018, 24 PPP projects had federal/national status, with private investment estimated at 496 billion rubles. Such PPP projects have a high cost (the minimum cost is at least 5 billion rubles), and the investor's participation rate is at least 25 %. In 2015-2018, several PPP projects implemented in the social infrastructure had the status of federal / national projects (development of "Perm state medical University named after academician E. A. Wagner, "eye microsurgery Center in Yekaterinburg", etc.) (Web portal «ROSINFRA», 2020).

Regional PPP projects contribute to the creation of rapid points of economic and social growth, are highly effective and have a relatively short implementation period (Beliakova,

M.Y. & Yurieva, T.V., 2020). Regional projects attract a larger range of stakeholders and organizations and therefore lead in terms of private investment. The regional structure of PPP projects allows us to make a conclusion about uneven development across Russian regions. The most advanced regions for PPP projects are: Moscow, Saint Petersburg, Moscow region, Republic of Bashkortostan, Samara region, Khanty-Mansi Autonomous Okrug-Yugra, etc. At the same time, in some regions, PPP projects still take an insignificant position (the Republic of Kalmykia, the Republic of North Ossetia-Alania, the Republic of Ingushetia, etc.) (Web portal «ROSINFRA», 2020). The characteristics of the most significant regional PPP projects in the social infrastructure of the Russian Federation, an agreement on which was reached in 2019, are presented in the table.2.

**Table 2: Projects in social infrastructure with the use of PPP mechanisms in the regions of the Russian Federation\***

n/n	Project name	Region implementation	Industry of project's implementation	Project cost, million rubles
1.	Financing, design, construction, reconstruction and service of an educational complex with a capacity of 4550 seats	Nizhny Novgorod and the city district of Bor	Education	6136.6452
2.	The concept of the life cycle of medical equipment (project 1 - angiography)	Moscow	Health care and Spa treatment	654.966
3.	Project for creating health facilities (multidisciplinary rehabilitation center) on the territory of the International medical cluster (project 3)	Moscow	Health care and Spa treatment	3969.757
4.	Project for creating healthcare facilities (educational and research centers) on the territory of the International medical cluster (project 4)	Moscow	Health care and Spa treatment	3200
5.	Financing, design, construction and service of the full year children's	The Republic Of Sakha (Yakutia)	Children's recreation and Wellness	1473.651

	recreation and recreation center "Polyarnaya Zvezda"			
6.	Creation of a health-resort complex, including repair and restoration works of the cultural heritage object of regional significance "Sanatorium" Kislovodsk»	Stavropol territory	Health care and Spa treatment	1800
7.	Youth sports complex	Khanty-Mansiysk	Physical culture and sports	5750
8.	Creation and operation of a sports facility-a skating Rink with artificial ice for training and recreational activities of the population	the city of Elista	Physical culture and sports	200
9.	Creation and operation of cultural objects " the State Philharmonic society of Yakutia and the Arctic epic and arts center»	The Republic Of Sakha (Yakutia)	Культура, досуг, туризм и реставрация объектов культурного наследия	9942.9206
10.	Construction of a Spa complex	Altai Republic	Physical culture and sports	770

*\* PPP projects with agreements signed in 2019.*

*Source: author's compilation based on Web portal «ROSINFRA», 2020.*

The largest number PPP projects is implemented at the municipal level. Such projects are mostly small. Currently, their number exceeds 3,000 projects, and the total volume of private investment is estimated at almost 370 billion rubles. Many municipal PPP projects are related to social sectors such as social services, children's recreation and health improvement, physical culture and sports, education, leisure, tourism, etc.

### **Implementing mechanism of PPP projects in social infrastructure**

PPP projects in social infrastructure are developed and implemented by public and private partners. Private participants can be commercial or non-commercial organizations. It should be noted that Russian legislation imposes a number of restrictions on the possibility of some organizations to participate as private partners in PPP projects. State and municipal unitary enterprises, state and municipal institutions, public law companies can't participate as private partners in PPP projects. At the same time, the private partner should have the necessary licenses; he should not have any debts on payment of taxes and fees,

or signs of bankruptcy. In addition, private partner can't suspend economic activity at the time of submitting an application for participation in the competition. When implementing PPP projects in social infrastructure, it is necessary to take into account that the interests and goals of public and private partners may not coincide and have the opposite direction. Therefore, at the stage of project initiation, it is necessary to pay significant attention to identifying the interests of all stakeholders and then effectively manage them. Taking into account the functional orientation of the social sphere in modern society, the state, concluding an agreement with a private partner on the creation, reconstruction, and maintenance of a social infrastructure object, is guided not only by business interests, but also by public interests, which often require a deviation from market criteria for evaluating the project.

In general, the interaction of public and private partners in the social infrastructure sphere is profitable for all participants of the agreement, as well as to society as whole. The result of the partnership is intensive development of social infrastructure; reduction of government spending, risks, project deadlines and costs; improving the quality of work and management through innovation, competencies of private partners; increase in the number of jobs; creating a positive image of the state and business in society. State bodies are exempted from the function of monitoring investment and focus on the management of quality of service. While the private partner optimizes the process of financing the project in order to ensure the required quality of the object of the agreement. Without attracting private capital and effective managers, the state in most cases is unable to provide the necessary level of provision of social public goods and services.

Among the most significant advantages of a public partner in the implementation of PPP projects in social infrastructure are the following: participation in socially important infrastructure projects in the context of limited budget funds; creation and modernization of state and municipal property; reduction of the risks of overstating the project cost and operating its final result; the possibility of using modern engineering solutions, innovations, management methods, professional experience of employees of private structures.

The benefits of private partners include: expanding the boundaries of doing business; the ability to distribute risks between partners; investing in long-term fixed-income projects under government guarantees (obligations); increasing revenue by providing additional paid services; reducing administrative costs, etc.

World practice shows that PPP projects carried out in social infrastructure are implemented through the following economic mechanisms:

- Build – Operate – Transfer (BOT).
- Build – Own – Operate – Transfer (BOOT).
- Build – Transfer - Operate (BTO).
- Build – Own – Operate (BOO).
- Build – Operate – Maintain – Transfer (BOMT).

Design – Build – Own – Operate – Transfer (DBOOT).

Design – Build – Finance – Operate (DBFO).

Design – Build – Finance – Maintain (DBFM).

PPP projects in social infrastructure are implemented through various organizational and legal forms, which differ in the degree of responsibility of public and private partners for the design, creation, financing, operation and management of the object of the agreement. Concession (concession agreement) is the most common and developed form of PPP projects implementation in social infrastructure in many countries.

Currently, almost 60 % of PPP projects in the social infrastructure of Russia are implemented in such forms as a concession and a PPP agreement. Such projects account for 40% of the volume of private investments allocated for such purposes (table 3).

**Table 3: PPP projects on the main forms of implementation and the volume of private investment in the Russian Federation**

Sphere	Concession and PPP Agreement		Quasi-PPP	
	Number of projects	The volume of private investment, billion rubles	Number of projects	The volume of private investment, billion rubles
Transport sphere	69	828.4	55	464.2
Utilities and energy sector	2656	343.3	75	216.9
Social sphere	266	112.8	186	133.8
It-infrastructure	20	43.5	13	5.95
Defense and security	1	18	-	-
Industry	-	-	11	5.6
Accomplishment	20	3.7	42	3.5
Agricultural industry	2	0.2	6	2.3

*Source: author's construction based on National Center for Public-Private Partnerships, 2019. Simple and Honest about Investment in Infrastructure and Public-private Partnerships in Russia. Analytical Review. Moscow: National Center for Public-Private Partnerships. P.22-23.*

Under the terms of the concession agreement, the public partner, being the full owner of the object of the agreement, transfers the private partner to perform a number of functions for a certain period. In turn, the private partner (concessionaire) is obliged to pay a fee for the use of the social infrastructure object, which is in state or municipal ownership.

Another organizational and legal form for implementing projects in the Russian economy, the PPP Agreement, is still in the process of being established. In 2018, four such projects passed commercial closure. All of them were related to the development of social

infrastructure: a sports complex and a center for additional education in Volgograd (40 million rubles); a sports and recreation complex in Naberezhnye Chelny (395 million rubles); a sports cluster in Voronezh (203 million rubles).

PPP projects in social infrastructure are also implemented on the basis of so-called "quasi-PPP" (life cycle contract, lease with investment obligations, etc.). Currently, in the Russian economy, about 40% of PPP projects in social infrastructure are in the form of quasi-PPPs. This form accounts for almost 60% of the volume of private funds invested in social infrastructure (table.3). The largest part of quasi-PPP projects, especially large ones, comes from Russian regions that have developed investment legislation (Moscow, etc.). This form of "quasi-PPP" as "life cycle contract" is increasingly being used. It is based on a special mechanism of interaction between public and private partners, called DBFM. In this case, the project is implemented on the basis of an agreement with a private partner, which includes the design, creation and operation of the agreement object for the entire period of its life cycle. In the "life cycle contract", the private partner attracts investment resources based on project financing. The public partner does not perform the function of an investor; its task is only to pay for products created during the operation of the agreement object. The payment condition is that the private partner complies with certain parameters for the operation of the agreement object. This approach increases the efficiency of economic activity and stimulates the quality of provided products.

The initiative to create a PPP project in social infrastructure can come from both a public and a private partner. The selection of projects takes place on a competitive basis, taking into account financial, economic, budgetary, social efficiency, as well as risk indicators.

Investments in social infrastructure projects are considered highly risky and less profitable compared to other sectors of the economy. This is due to the fact that the social sphere is characterized by diverse demand, difficulties in forecasting the consumer flow, as well as evaluating the social effect. As a result, private partners prefer to invest resources mainly in projects that have significant guarantees from the state.

In order to assess investment risks projects related to social infrastructure facilities are divided into two groups:

1. projects with a fixed flow of payments проекты, (the minimum yield is guaranteed by the state);
2. projects where revenue is determined by the level of consumer demand.

The first financial model provides a higher investment attractiveness of the project and allows you fully consider the risks. The second financial model is less attractive and more risky. In this case, the private partner may require additional guarantees from the state [Agency for Strategic Initiatives. Public-Private Partnership Development Center, 2016].

Proper identification and allocation of risks in a PPP project has a significant impact on its success. At the same time, it is recommended to keep risk accounting and assessment at all stages of the project life cycle. A balanced division of predicted risks between a public and private partner has a positive effect on the overall risk assessment, since each of the participants is responsible for the part in which it is more effective [Delmon, J., 2015].

Among the main risks of PPP projects in social infrastructure, the following can be identified: design and preliminary stage; object creation; object operation; income generation; and other risks. These risks can be classified as typical for all investment projects (management, economic, construction); typical for PPP projects (political, legal); typical for projects in the social infrastructure.

Public and private partners of the PPP project use different methods of risk assessment. A private party to the agreement evaluates different types of risks primarily in terms of value. The public partner evaluates the project's risks based on its social significance and usefulness. The resulting project risk assessment is a determining factor when making a decision to participate in the project, and allows you to distribute effectively responsibility for risk management [Tsvetkova, L., Yurieva, T., Orhaniuk-Malitskaia, L., Plakhova, T., 2019]. However, the full distribution of risks between public and private partners cannot always be achieved and responsibility for some of the risks falls on the two partners. Choosing the right solution depends largely on the depth of the project's risk analysis.

A special place in the implementation of PPP projects in the social infrastructure is given to their provision with financial resources. The limited resources of the state and private companies, the need to implement complex projects featuring by high risks, created prerequisites for the formation and development of such an effective model of attracting financial resources as "project finance". The mechanism of this model assumes that financial assets are attracted exclusively for the implementation of a specific project, while the obligations for them must be repaid from the future income of the project, and only its assets are pledged. The main provisions of the project Finance concept are described in detail in the works of such scientists as B. C. Esty, E. Farquharson, S. Gatti, E. R. Yescombe и др. [Esty, B. C., Chavich, C., & Aldo, S., 2014; Gatti, S., 2013; Yescombe, E. R., 2014; Yescombe, E. R. & Farquharson, E., 2018]. Despite the significant advantages of the project Finance model, it is not always appropriate to use it in social sectors where there is a high uncertainty of profit generation [Yurieva, T.V., & Voropaeva, L.N., 2019].

In order to improve the efficiency of PPP projects in social infrastructure, the state should implement a set of regulatory actions: constant monitoring and supervision of the execution of the project agreement obligations; reviewing the terms of the agreement, if necessary; accepting proposals from private participants aimed at improving the implementation of the agreement terms; reviewing consumer claims for the final result of the project; conducting a state audit, etc. Among the measures of economic stimulation of PPP projects, tax benefits should be allocated to private partners. These can be benefits for

paying property tax, income tax, or transport tax. Non-tax measures include preferential or gratuitous connection to utility networks; subsidized interest rates on loans; providing technical and organizational assistance in the implementation of projects, etc.

## **Conclusion**

The quantity and quality of social goods and services have a significant impact on the development of human capital, which is an essential prerequisite for sustainable growth. The provision of private social benefits and services is carried out by business, taking into account effective demand. The provision of public social goods is a function of the state. The challenges of the modern economy require increased spending on their production and, above all, on the creation, reconstruction and operation of social infrastructure facilities. In conditions of limited resources of the state, inefficiency of increasing the tax burden, it is appropriate to attract additional private investment in the social sector through the implementation of projects based on the principles of public-private partnership. PPP projects are one of the most effective tools for implementing investment policy, which helps to consolidate the resource, financial and managing potential of the state and private business. PPP projects in social infrastructure are beneficial to project participants and society as a whole.

World practice shows that PPP projects are actively used in such sectors as health and education. Promising areas of PPP projects are the infrastructure of such industries as tourism, culture and cultural heritage, physical culture and sports. PPP projects in social infrastructure are implemented through various organizational and legal forms. The most common and developed form of PPP projects in social infrastructure is a concession. Investments in social infrastructure projects are considered highly risky. The main risks of PPP projects in social infrastructure are divided into three groups: typical for all investment projects; typical for PPP projects; and typical for social infrastructure projects. The resulting risk assessment is a determining factor in making a decision to participate in the project, and allows you to distribute effectively the responsibility for risk management.

Limited resources, the need to implement complex social infrastructure projects with high risks, stimulate a more active use of such model of attracting financial resources as "project finance".

The development of social infrastructure through PPP projects requires an effective public policy that includes a set of administrative and economic measures, as well as the availability of professional competencies in the field of project management for all project participants.

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