



PROJECT FINANCE: PRINCIPLES AND EFFICIENCY

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Abstract

The paper covers the analysis of project finance, one of the most effective mechanisms for attracting investments to implement major, complex and expensive projects under high risks and uncertainty. The notion of 'project finance' and its key features were redefined by analyzing scientific publications, research carried out by experts and international economic organizations. It was demonstrated that a risk management system, identifying and sharing risks among its participants and assuming the presence of an appropriate security and guarantee package, is an integral element of project finance system. Project finance is characterized by a large number of stakeholders, necessitating organization of an effective system for managing their interests and contracts. Project finance involves a comprehensive analysis, the level of detail of which depends on project scale, possible risks, and social and economic impacts of management decisions. The advantages and disadvantages of project finance were determined in comparison with other financing models with regard to the interests of their participants. A significant share of global project finance market accounts for infrastructure projects, as well as projects in oil and gas production, involving both developed and developing countries. Modern project finance market is characterized by the decreasing share of public funds in financing of major infrastructure projects, including based on PPP principles, continuously improving the mechanism for attracting new sources of financing (infrastructure bonds, etc.). In the Russian economy, project finance is mainly used in large investment projects in oil and gas production, transport infrastructure, electric power industry, etc. Many of these projects are implemented based on PPP mechanism, allowing not only getting the financial resources required, but also increasing the efficiency of utilizing state budget funds, applying advanced production, information and management technologies, professional competencies and skills of private partners, and reducing entrepreneurial investment risks. Effective interaction between the state and private businesses is based on sound legislative base, proven bureaucracy, reasonable return on investment rates, acceptable project payback periods for public and private partners.

The research involved analysis and synthesis, comparison, classification, as well as logical and statistical analysis methods.

Keywords: project management, project finance, infrastructure projects, public-private partnership, transport infrastructure.

JEL code: G11, O22

Introduction

Project management has proven to be an effective tool for initiating, planning and implementing any project. The essence of project management is using appropriate methods, tools, techniques and competencies when implementing projects (Voropaeva L.N., & Yurieva T.V., 2017). It should be considered that project management is carried out by implementing a set of processes (ISO, 2012).

Emergence of project management in major economies dates back to the 1950s. Project management techniques are traditionally used in construction, defense, oil and gas complexes and information technology. Over the last period, they have been increasingly introduced in social sector, and in state and local government system. Organizations using the project approach manage to ensure an innovation-based development, improve competitiveness, and prevent crisis amid continuous change (Kerzner H.R., 2013).



Financial security of projects is the most important part of project management. Projects can be implemented based on various financing models. Large investment project management under high risk is generally based on a special financing model, referred to as “project finance”.

Scientific publications, research carried out by experts and international economic organizations give much attention to understanding the notion of project finance.

In particular, the Basel Committee on Banking Supervision at the Bank for International Settlements defines project finance as a special financing method when funds are raised to carry out a particular project on the condition that they will be repaid from future project income with project assets being the only pledge. It is noted that a characteristic feature of project finance is the presence of a legally and economically independent project company operating based on own project initiators (sponsors) funds (Basel Committee on Banking Supervision, 2004, p.61).

The first research papers on project finance were published in such journals as Harvard Business Review and Sloan Management Review in the late 1970s and early 1980s. The most part of research on various project finance aspects was carried out during the past decade. Many of them have been published in such well-known journals as the International Journal of Project Management, the Journal of Applied Corporate Finance, the Project Management Journal, World Development, and others, and are mainly practical (Müllner J., 2017).

The theory and methodology of project finance is best described in the works by the following researchers: P. Benoit, E. Bulievich, S. Gatti, E.R. Yescombe, W.L. Megginson, I.A. Nikonova, P.Nevitt, Y. Park, A.L. Smirnov, A. Steffanoni, F. Fabozzi, A. Fight, B. Esty, etc.

Emphasis should be laid on works by S. Gatti (Gatti S., 2005, 2008, 2013), P. Nevitt and F. Fabozzi (Nevitt P., & Fabozzi F., 2000), who were the first to comprehensively study the project finance mechanism. Their works define project finance as a special financing model based on raising funds to carry out a particular project on the condition that they will be repaid from future project income, and only project assets are considered as a pledge.

Works by B. Esty and other authors (Esty B., 2004; Esty B., Chavich C., & Sesia A., 2014) pay great attention to studying the nature and functions of the project company, which is central to and a feature of the project finance model. In B. Esty’s opinion, the essence of project finance is to make three management decisions: investment, organizational and financial. The mechanism of their implementation in developing and executing a project gives grounds to distinguish project finance from other financing models (Esty B., 2004).

Many aspects of project finance mechanism, especially when implementing public-private partnership (PPP) infrastructure projects, are disclosed in research by E.R. Yescombe (Yescombe E.R., 2014, 2018).

Among Russian experts, research by I.A. Nikonova (Nikonova I.A., 2012; Nikonova I.A., & Smirnov A.L., 2016) and A.L. Smirnov (Nikonova I.A., & Smirnov A.L., 2016) give the most complete idea of project finance, taking into account its global development trends and the specifics of Russian economy. In Russia, various aspects of project finance are researched and coordinated by the Federal Center for Project Finance, State Corporation “Bank for Development and Foreign Economic Affairs (Vneshekonombank)”, which is one of the development institutions.

Although there is a number of publications on project finance, some matters remain understudied. This particularly applies to treating project finance as a system involving a number of stakeholders, the principles of their performance and interaction. PPP project finance



model and the mechanism for evaluating its effectiveness call for further research. All of the above determines relevance of the research.

Project Finance as a System

The core of project finance is that investment is made in a particular project, rather than in the borrower's business operations in general. Therefore, the source of return on investment is profit made from a particular project isolated from project initiators' business performance. Project finance can be provided by banks, corporations, and in partnership with the state.

Bank project finance uses the following financing products: non-recourse; limited recourse; full recourse.

With non-recourse project finance, lenders take into account only the expected project cash flows, their credit assessment does not depend on the creditworthiness of project sponsors. Therefore, the cost of finance is high, since all project risks are borne by the lender. This form of financing is typical for highly profitable projects.

Limited recourse finance is based on identifying and distributing potential risks among project participants. With full recourse finance, financial resources are received under specific guarantees, i.e. a certain form of limitation of project lenders' liability. The risks are borne by the borrower, and, as a rule, the price of loan is moderate, allowing for a quick receipt of funds for the project. This type of financing is typical for low-profit and charitable projects.

Real-world contexts allow for a combined form of financing, when lenders mainly rely on future project cash flows, but at the same time, it is allowed to use the borrower's ongoing business' net profit to repay the debt. Both the project assets and the borrower's property are pledged.

Corporate project finance involves financing projects with the organization's own resources.

Project finance in partnership with the state is a special type of contractual project financing between private and public partners, involving sharing of their assets, risks and benefits from the production of goods, works and services. This project finance scheme is mainly used in PPP project implementation.

The project finance model is opted for in a situation when there is a need to make solid long-term investments with insufficient own funds, high level of risk, and the complexity of the project itself.

Project finance is a high-risk financing involving identifying and sharing risks among its participants and assuming the presence of an appropriate security and guarantee package. Therefore, building and developing a risk management system is an integral element of project finance system. Project finance is characterized by a large number of stakeholders: project sponsors/initiators, project company, lenders, third-party investors, contractors, customers, suppliers, buyers, insurers, risk managers, government agencies, consultants, etc. All that makes it necessary to organize an effective system for managing their interests and contracts.

Project finance necessarily involves a comprehensive analysis, the level of detail of which depends on project scale, possible risks, and social and economic impacts of management decisions, etc. Project analysis employs such methods as express diagnostics, strategic analysis and other types thereof (technical, business, institutional, economic, financial, environmental), as well as quantitative and qualitative risk analysis, etc. All of the above determines the essential role of consultants with the necessary professional competencies in various areas of project finance.

Project finance has advantages and disadvantages in comparison with other financing models.



The overall advantages of project finance include:

- project-based approach;
- total risk management;
- high level of control during project implementation;
- higher added value due to expense reduction, asset and liability structure improvement, tax mitigation, etc.

From the borrower's perspective, the benefits of using project finance mechanism include:

- treating the project as a separate part of business;
- risk sharing among the participants;
- project management without reducing resources for the organization's core operations.

The benefits for project finance lenders include:

- a high level of income in the absence of risks unrelated to project implementation, and a possibility to partially fund lending resources;
- potential losses are limited only to the amount of capital invested in a project company,
- project and its inherent risks separation does not affect the overall investment rating of the company.

Application of project finance techniques may not lead to certain benefits, since it is a complex process fraught with high level of risk and uncertainty.

The overall disadvantages of project finance model include:

- conflicts due to the large number of participants representing different interests, various complex contracts, high risks;
- higher administrative costs driven by creation of an independent organizational structure, involvement of highly qualified specialists, complex expert examination, property appraisal, etc.

Imperfections of project finance for the borrower include:

- high loan interest rates;
- substantial time and transaction costs;
- constant supervision by the lenders;
- low level of independence in making management decisions.

Negative implications of project finance for the lender:

- the need for an in-depth project analysis;
- tightened control at all project stages;
- no recourse to the project company's owners.

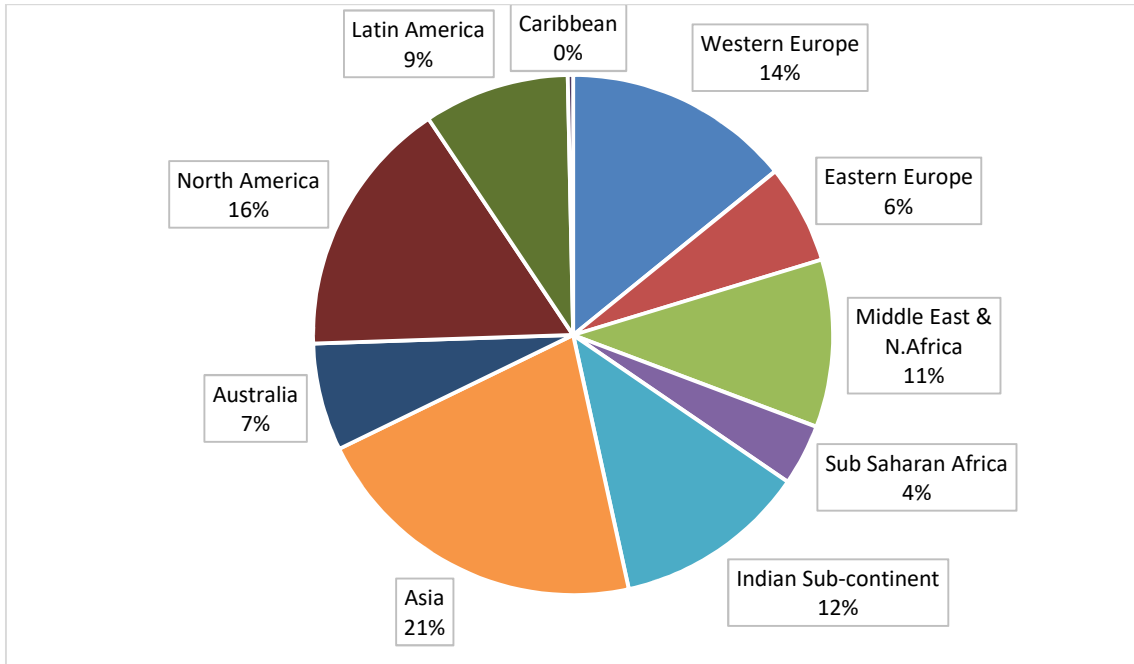
Global Project Finance Market

In global practice, project finance is mainly used in major, complex and expensive projects (construction or reconstruction of energy, transport and telecommunications infrastructure facilities, etc.) under high risk. In today's context, Burj Khalifa Skyscraper in Dubai, the Eurotunnel, the Hong Kong-Zhuhai-Macau Bridge can be used as examples of project finance.

Data published by International Financial Law Review (IFLR), the leading professional publication, show that at the end of 2017 the volume of the global project finance market slightly decreased compared to 2015-2016 and amounted to USD 338.5 million (Project Finance



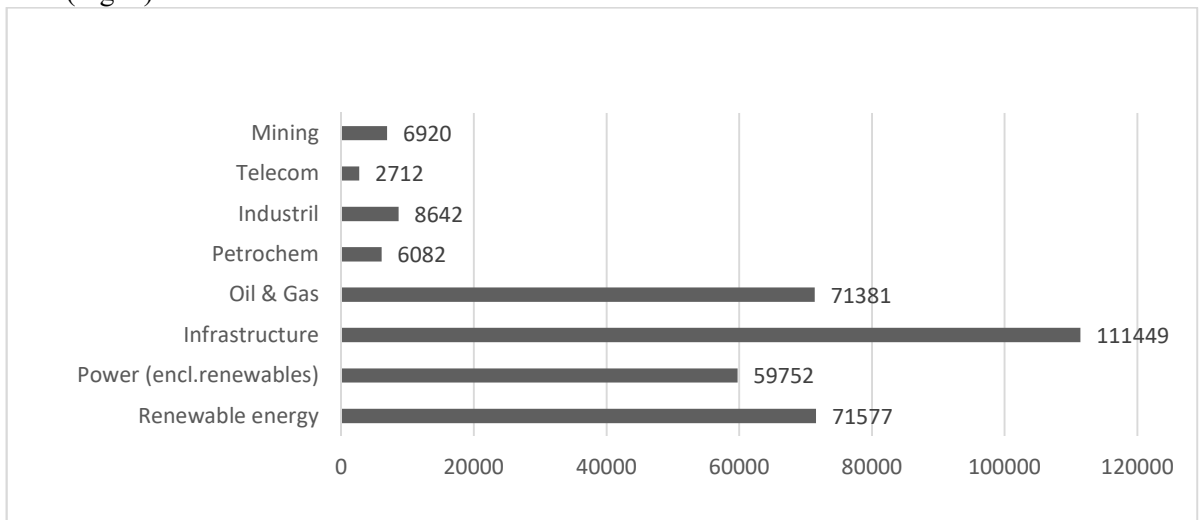
Report, 2018). A regional analysis of the global project finance market shows that the model is actively employed not only in developed but also in developing countries (Fig. 1).



Source: author's construction based on Project Finance Report 2018. IFLR International Financial Law Review

Fig. 1. 2017 Global Project Finance Market: Regional Dimension (USD million)

Industry analysis of the global project finance market brings us to a conclusion that a significant share of costs accounts for infrastructure projects, as well as projects in oil and gas production (Fig. 2).



Source: author's construction based on Project Finance Report 2018. IFLR International Financial Law Review



Fig. 2. 2017 Global Project Finance Market: Industrial Composition (USD million)

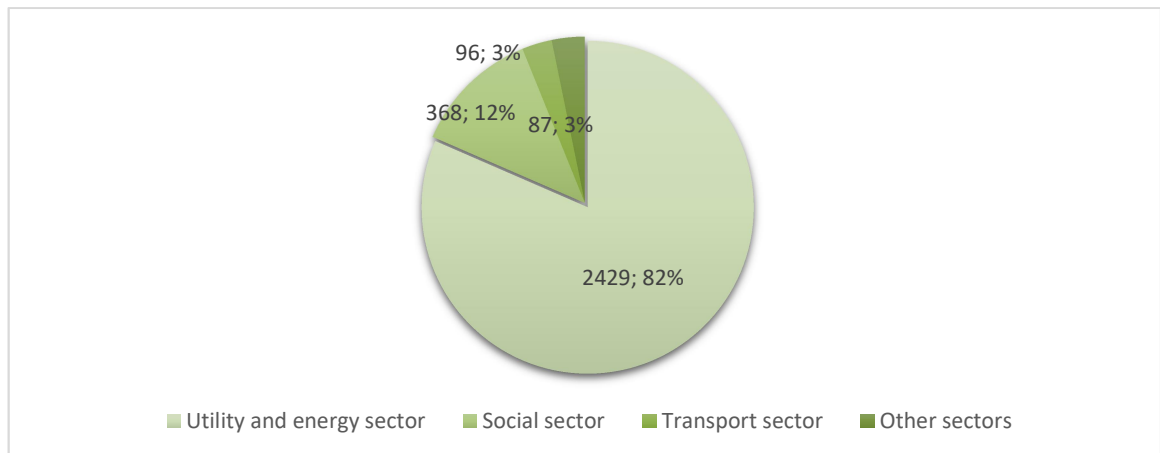
Modern project finance market in developed countries is characterized by the decreasing share of public funds in financing of major infrastructure projects, including based on PPP principles, continuously improving mechanism for attracting new sources of financing, like infrastructure bonds, etc. (Müllner J., 2017).

According to IFLR agency, in 2017 Russia ranked 6th in the global project finance market with a transaction volume of USD 16,611 million (Project Finance Report, 2018). In the Russian economy, project finance is mainly used in large investment projects in oil and gas production, infrastructure projects in electric power industry, transport, etc.

PPP Projects as a Form of Project Finance

Given the state budget limits, it is critical to search for new mechanisms to attract long-term investment resources. PPP is one of the most effective mechanisms. It should be noted that this mechanism allows not only getting the financial resources required, but also increasing the efficiency of utilizing state budget funds, applying advanced production, information and management technologies, professional competencies and skills of private partners, and reducing entrepreneurial investment risks. Effective interaction between the state and private business is based on sound legislative base, proven bureaucracy governing relations between public and private partners (Yurieva T.V., 2016).

According to PPP Development Center (Rosinfra, 2019), a significant part of PPP projects in the Russian Federation is implemented in utility and energy sector, mainly at the regional and municipal levels (Fig. 3).



Source: Rosinfra, 2019

Fig. 3. Industrial Composition of PPP Projects in the Russian Federation

PPP projects play a major role in creating and upgrading infrastructure facilities that create key factors for the development of the national economy and its interaction with the international market. Transport infrastructure is one of the most important tools for spatial integration and improved availability of various places. On a mid-term horizon, the Russian Federation will focus on projects for the construction of new and reconstruction of already



existing transport infrastructure facilities, the scope of financing of which goes beyond the federal, regional and city budget limits. Therefore, project implementation would involve various extra-budgetary sources of financing, including participation of private capital based on PPP principles.

Airports are the fastest growing transport infrastructure segment in Russia. Between 2010 and 2017, the number of people transported by air has increased from 59 to 108 million people, that is, nearly doubled (Russian Statistical Yearbook, 2018, p. 449). The growing public demand for high-quality airport services makes airport infrastructure very attractive for investors. That's the segment of the transport infrastructure that has been reforming and upgrading, creating concessions the most.

Main industry trends:

- federal airports asset consolidation;
- transfer of airport airfield infrastructure to private shareholders to concession;
- transfer of ownership of regional airports to the regions and regional airports privatization. Over the past few years, airports in Perm, Irkutsk, Krasnoyarsk, and Sakhalin have been transferred from federal to regional ownership. Regional governments started to work more actively to attract private investors in airport development, which also reduces the burden on the federal budget.

In 2017-2020, investments in airport infrastructure will amount to about RUB 330 billion at the level of the past five years, the share of private investment is 40% (RUB 130 billion). Sheremetyevo airport expansion is still the biggest investment project: construction of runway-3 funded by the federal budget and terminal B with an underground passage between the southern and northern areas of the airport (construction is funded by private investors). Construction of Yuzhny airport in Rostov-on-Don is the second biggest project in terms of investment with a value of RUB 37.2 billion, half of which is public money and the other half is private investment made by Airports of Regions holding company, a part of Renova State Corporation. Big investments go to upgrade regional airports in Tyumen, Novosibirsk, Yakutsk, Khabarovsk, Kaliningrad, Nalchik, Surgut, Murmansk, Chelyabinsk, Saratov (Voropaeva L.N., 2017, p. 39).

The largest airport holding companies - Novoport, Airports of Regions, Basic Element, are ready to develop Novy Urengoy Airport, which still has no key investor. Its current passenger traffic does not exceed 1 million people a year. Though investors expect to have significant income due to a steady demand from oil and gas industry workers. Over 2018-2020, a new air terminal will be built, the runway will be upgraded, and boarding bridges will be purchased resulting in passenger services provided up to the international standard. The complexity of the project is driven by physical features limiting construction season to a short summer period. Runway reconstruction is meant to provide an opportunity to accommodate all types of medium-haul aircraft flying to the European part of the country. The capacity should increase from the current 150-200 people per hour to 800. Investments are tentatively estimated at RUB 6 billion. Under the tender terms and conditions, all airport facilities will be leased to the investor for 30 years, and then returned to the ownership of Yamalo-Nenets Autonomous District. The agreement with investors provides for the second stage of reconstruction if the passenger traffic reaches 1.45 million people per year: international terminal creation, capacity increase to 1,200 people per hour, runway elongation to 3 km.

Regional analysis of PPP projects shows that the level of PPP development is different across Russian regions. It is evaluated with "the level of public-private partnership development in the constituent entities of the Russian Federation" indicator calculated taking into account the following factors: institutional environment; legislative environment; project experience. So far,



Moscow, Saint Petersburg and Moscow Region are on top of the list in terms of PPP development. The Republics of Kalmykia, North Ossetia-Alania, Ingushetia have the lowest indicator.

Since PPP projects involve both public and private partners with different economic interests, it becomes important to find effective types of return on private investment. These include the following: availability payment; direct tolling and other business operations carried out by a private partner at controlled prices (rates); guaranteed minimum return; direct tolling and other business operations carried out by a private partner with no guarantees from the public partner, etc. Table 1 presents data on PPP project distribution in the Russian economy by the type of return on investments to private partners.

Table 1

Type of Return on Private Investments for PPP Projects in Russian Federation

Type of Return on Private Investments in PPP Projects	PPP Projects Administration Level					
	Federal		Regional		Municipal	
	Number of Projects	In % of the total	Number of Projects	In % of the total	Number of Projects	In % of the total
Availability Payment	10	66.7	38	19.7	53	2.7
Direct tolling and other business operations carried out by a private partner at controlled prices (rates)	0	-	85	44.0	1,817	92.0
Guaranteed Minimum Return	1	6.6	20	10.4	2	0.1
Direct tolling and other business operations carried out by a private partner with no guarantees from the public partner	4	26.7	50	25.9	103	5.2
Total	15	100	193	100	1,975	100

Source: author's calculations based on "Study"Public-Private Partnership in Russia 2016-2017, p.9-10.

When analyzing PPP project performance, it is reasonable to distinguish two levels of the rate of discount (E): macroeconomic (E_n) and business (E_b). The separation is due to the fact that the state and a private partner have different rates of return due to different acceptable payback periods. Several authors point out that the rates of discount require a nuanced approach (Khalturin R., 2012; Volkov B.A., 2009). 3-7 years, up to 10 years in big projects, is an acceptable payback period for a private partner. 25-30 years and 50 years in socially significant projects can be acceptable for the state (Voropaeva L.N., 2017, p.40). In some cases, the state



may not be aimed at returning the invested funds. Therefore, the rate of discount $E = 5-10\%$ can be used for the state, and $E = 12-18\%$ - for a private partner. This will allow the state to be more flexible with the range for adjusting the shares in investment projects, by increasing its investment burden and reducing the burden on a private partner.

The choice of the value of the rate of discount (E) depends on the following factors:

- investment goals and project implementation conditions;
- the rate of inflation in the national economy;
- investment risk value;
- alternative capital investment opportunities;
- investor's financial and other insights and ideas (Voropaeva L.N., 2017, p. 41).

To encourage participation of private businesses in PPP projects, a special bonus system can be applied, ensuring that a private partner gets remuneration from the state for a timely facility commissioning.

Generally, it might be said that though project finance in view of PPP principles is attractive for infrastructure development, investor attraction is somewhat held back, which is explained by a number of factors, including macroeconomic ones.

Conclusion

Given limited own financial resources of organizations, they should be more actively raised under project finance principles, the essence of which is that an investment is made in a particular project, rather than in the borrower's business operations in general. The source of return on investment is profit made from a particular project isolated from project initiators' business performance.

Project finance is a system including many elements (participants, projects to be financed, contracts, risk management, infrastructure) that are closely interrelated and ensuring cash flow efficiency. The project finance model is opted for in a situation when there is a need to make solid long-term investments with insufficient own funds, high level of risk, and the complexity of the project itself.

Analysis of the global project finance market shows that the model is actively employed both in developed and developing countries. It is particularly effective in implementing PPP investment projects in countries and regions with underdeveloped institutions. Project finance in developed countries is characterized by the decreasing share of public funds in financing of major infrastructure projects and continuously improving mechanism for attracting new sources of financing.

In the Russian economy, project finance is mainly used in big investment projects in oil and gas production, electric power industry, transport, etc., many of which are based on PPP principles. PPP projects play a major role in creating and upgrading infrastructure facilities, especially airports. That's the segment that has been creating concessions the most. The PPP mechanism allows getting the financial resources required, reducing investment risks, gaining access to advanced technologies, using the professional competencies and skills of private partners.

Driven by the fact that both public and private partners with different economic interests participate in PPP projects, it is necessary to find effective types of return of investment to private investors, which depend largely on project administration level (federal, regional, municipal).

When analyzing PPP project performance, it is recommended to distinguish two levels of the rate of discount (E): macroeconomic and business. The separation is due to the fact that the



state and a private partner have different rates of return due to different acceptable payback periods. To encourage participation of private businesses in PPP projects, it is suggested to use a special bonus system ensuring that a private partner gets remuneration from the state for a timely or early facility commissioning.

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