

## RISK MANAGEMENT AND RISKS MITIGATION STRATEGIES FOR PUBLIC-PRIVATE PROJECT MANAGEMENT

## УПРАВЛІННЯ РИЗИКАМИ І СТРАТЕГІЇ МІГІТАЦІЇ РИЗИКІВ ДЛЯ УПРАВЛІННЯ ДЕРЖАВНО-ПРИВАТНИМ ПРОЕКТОМ

*Risk and uncertainty are essential and defining features of any public-private project. A complete project idea cannot be finalized without considering the associated risks. The importance of project risk is also given by the statement: "project management means risk management". The sign of equality between these two types of managerial approaches emphasizes the determining character where good risk management plays an important role in project implementation. And of course, if there were no risks, you probably wouldn't need a project manager! At first sight, it can create the impression that in a public-private partnership for each of its participants, the risks will be lower than in the implementation of an independent project. However, in practice, only the public partner in this type of partnership reduces its risks due to the involvement of a private partner who has the necessary skills and experience to implement the project. Thereby, one of the most significant aspects of the relationships between public-private project partners is risk management and risk mitigation strategies that are going to be analysed in the present article.*

**Key words:** project management, risk management, risk strategies, public-private partnership, organization, analyses.

*Риск і неопределенность являются важными и определяющими характеристиками любого государственно-частного проекта.*

*Полная идея проекта не может быть завершена без учета связанных рисков. Важность проектного риска также определяется утверждением: «Управление проектом означает управление рисками». Знак равенства между этими двумя типами управленческих подходов подчеркивает определяющий характер, при котором хорошее управление рисками играет важную роль в реализации проекта. И, конечно, если бы не было рисков, возможно, вам не понадобился бы руководитель проекта! На первый взгляд может сложиться впечатление, что в государственно-частном партнерстве для каждого из его участников риски будут ниже, чем при реализации независимого проекта. Однако на практике только государственный партнер в этом типе партнерства снижает свои риски за счет привлечения частного партнера, который имеет необходимые навыки и опыт для реализации проекта. Таким образом, одним из наиболее важных аспектов взаимоотношений между государственно-частными партнерами проекта является управление рисками и стратегии снижения рисков, которые будут проанализированы в данной статье.*

**Ключевые слова:** управление проектами, управление рисками, стратегии рисков, государственно-частное партнерство, организация, анализ.

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*Ризик і невизначеність є важливими і визначальними характеристиками будь-якого державно-приватного проекту. Протягом всього процесу реалізації кожного державно-приватного проекту на його ефективність можуть вплинути ті чи інші типи ризиків. Як історичний досвід, так і практика застосування механізмів державно-приватного партнерства в сучасному світі підтверджує, що реалізація проектів державно-приватного партнерства пов'язана з безліччю ризиків, які можуть бути викликані як зміною параметрів зовнішнього середовища, в якій відбувається здійснення проекту, так і безпосередньо діяльністю партнерів державно-приватного проекту: це неузгодженість дій партнерів при управлінні ризиками в ході реалізації проектів державно-приватного партнерства, покладання на одного з партнерів проекту ризиків, непорівнянних із його можливостями, відсутність детальної інформації про проект, в тому числі недосконалість інституційного середовища державно-приватного партнерства та ін. Таким чином, по суті, повна ідея проекту не може бути завершена без врахування ризиків. Важливість проектного ризику визначається твердженням: «Управління проектом означає управління ризиками». Створення можливості хорошого управління ризиками є запорукою успішної реалізації проектів державно-приватного партнерства. І, звичайно, якщо б не було ризиків, можливо, не знадобився б і менеджер державно-приватного проекту. На перший погляд може скластися враження, що в державно-приватне партнерство для кожного з його учасників ризику будуть менше, ніж при реалізації незалежного проекту. Однак на практиці тільки публічний партнер в цьому типі партнерства має можливість реально знизити свої ризики за рахунок залучення приватного партнера, який має необхідні навички і досвід для реалізації проекту. Тому дана стаття присвячена аналізу одного з найбільш важливих аспектів взаємовідносин між державно-приватними партнерами проекту механізму управління ризиками і стратегії їх зниження, які можуть виникнути на етапі реалізації проекту державно-приватного партнерства.*

**Ключові слова:** управління проектами, управління ризиками, стратегії ризиків, державно-приватне партнерство, організація, аналіз.

**Problem statement.** Today, there is an urgent need to develop tools for ensuring public-private projects against risks, which are associated with the fulfillment of obligations by state and municipal authorities. If such tools are created and are functional, it will greatly simplify the practice of attracting investment funds, which PPP projects need.

**Analysis of recent studies and publications.** The topic related to infrastructure public-private partnership projects and their risk management has been studied in various international literature, by the

authors Anghelache, C., Baldwin J. R., Delmon J., Dembo R.S., Freeman A., Hopkin P., Wanner R.

**Parts of the common problem that have not been resolved previously.** In our country, a wide discussion on PPP risk management has not found a significant practical implementation yet because the examples of successful implementation of PPP projects are quite a few. Next, there is a need for an in-depth study of the essence of the public-private partnership, risk management, and implementation of risk mitigation strategies.

**The purpose of the article** is to research theoretical issues of risk mitigation strategies for infrastructure projects in public-private project management to ensure an effective risk management process.

**Statement of the main material.** Due to the diversity of the projects, there are different levels of risk exposure, because of the variety of the environmental factors in which they appear and evolve, and of the level of uncertainty which varies over a very wide range from one project to another. Even in the case where one project is similar to the previous one, there is a certain level of uncertainty and several risk factors, which belongs to the mentioned approach. This is due to project uniqueness. It is possible the activities that are carried out in a certain project were realized countless times before in the organization, and the related stakeholders have already worked together to achieve the goals and objectives, the uniqueness of the project is given by the new context, offered by the implemented project, in which all these activities and interactions take place.

Regardless of the general degree of risk and uncertainty that is specific to a project, the level of their manifestation during the life cycle of the project has an evolutionary character. This evolution shows that the maximum level of risk and uncertainty is reached at the initial stage when the project idea is not yet clearly submitted. During its implementation, the issues related to the performed activities are clearer because of a more complete information base; therefore the uncertainty decreases, and the probability and impact of possible risks are reduced. In this context, the project managers have to proceed, from the first stages of the project, by reducing the uncertainty through rigorous documentation on all activities that the project involves. Also, the activities and processes of risk management must be engineered from the development of the project idea, paying attention to the formulation of the objectives.

Within the organization, each project causes changes and results that have a level of uncertainty and leads to the appearance of organizational risks that come with the project. But these risks are taken into account in the decision-making process for the implementation of the project and their management is not usually the responsibility of the project manager. Thus, the project manager is responsible for managing project-specific risks that are associated with the project's coverage area. The specificity of a project is given by the activities that the project manager must carry out: the way it is correlated, the resources it has at its disposal, the people involved, the existing constraints, etc. For this reason, the identification of risks must start from the work breakdown structure and very good risk analysis.

The same importance has the correct determination of the succession of activities, since the "degree"

that a risk receives after the impact measurement, is dependent on the context in which the project is carried out: the consequences of a risk occurrence that could affect an activity, whether the activity is on the critical path or not [6, p. 45].

The risk management processes are iterative because the context in which the project takes place is constantly changing, the same as the risk factors. They are inextricably linked to each stage of project development and must comply with the risk management plan developed in the early stages and continuously improved throughout the life cycle.

One of the most important predictive factors for future activities is the experiences gained in projects implementation, a good project manager highlights important conclusions, after analyzing the risk factors that occurred in their development. In the risk factors identification process, based on previous experiences in similar projects, the manager offers a significant interest in the evolution of the following factors [4, p. 78]:

- Analysis of the registered performances, at the same time with those provided in the project. Identify the elements that led to changes in the project and highlight how these problems were solved.
- The global analysis of the activities, after the development of each project or subprojects – component of the project. Avoiding the synthesis leads to the iteration of crisis, due to insufficient knowledge of risk factors or the repetition of similar mistakes.
- Analysis of the final results of the project and, recording the opinions of the direct beneficiaries regarding the quality of products or services, the results from the implementation of the activities carried out.

For the project manager, the detailed analysis of all issues is an extremely important element of evaluation of the activities and decisions that must be taken in the development of a new project. The methodology of gaining useful information in the risk management domain, from the experiences registered in previous projects, requires the project manager to organize his specialized documentation so that it serves as a reference during the project implementation.

Risk management contributes, through its structure, to the detailing of the planned activities that represent an opportunity to identify the risks in time. To perform a detailed analysis, for each project activity, it is necessary to make a plan and a budget estimation that is difficult to perform, due to the existence of uncertainty factors.

The risk reduction on the whole project is, in fact, a sum of efforts for each independent activity, included in a subproject/work package, by identifying an appropriate strategy, for each level of the project development. The risks identified at the level of activities and the budget forecast could influence

small parts of the PPP project, because these small risks, in special conditions, could become critical, leading to catastrophic effects [5, p. 89].

*Planning for the response to risk factors.* Depending on the type of risks, as well as the intensity of their manifestation, the risks can lead to devastating effects within a project (generally, in case of their omission or due to the approach of an improper managerial strategy). Identifying the type of risk that can occur at different stages, as well as its magnitude, is the task of project managers. They need to build a risk management strategy and plan the response to the potential factors that will influence the good execution of the project as follows [8, p. 77]:

- to identify risks and define the potential negative impact;
- to assign the probability of risks occurrence;
- to reduce and eliminate potential risks;
- to develop strategies for reducing the possible negative effects of the remaining risks;
- to create strategies for developing opportunities and increasing positive effects.

As it turns out, the structure of the response strategy includes three important components: 1. Defining risks. Experience in carrying out managerial activities demonstrates that the rigorous description of the risk factors requires a very good understanding of their nature. This concerns the identification of the conditions for risk production and the consequences of their occurrence. 2. Realization conditions – involve the identification of the situations, which can lead to uncertainty in the project development. 3. Risks consequences – aims to identify possible negative results, which could be caused by risk occurrence conditions.

It is important to mention that a successful managerial policy provides, after the process of defining the risks, the registration of their consequences in the cost form, and include a plan of activities and the estimation of the possible damages, which could occur in the project development.

*Risk minimizing strategies.* After defining the risks and their probabilistic estimation, the main problem of the managers is to find the optimal response strategies, for the reduction of the project risks. In recent years, the recognition of the positive aspects of risks has led to the concern for response strategies development able to use opportunities. Depending on the different situations, five distinct categories of risk mitigation strategies are used in project risk management [6, p. 102]:

1. Risks Acceptance refers to how the project manager understands the risks and their probability of occurrence, together with the estimated consequences, and decides not to remove them. Such a strategy is usually used when the probability of a risk occurrence is very low and/or their consequences

for the subsequent development of the project are insignificant.

2. Risk avoidance is the strategy, used under certain conditions, within the risks minimizing. It is important to note that minimizing risks does not mean avoiding taking managerial decisions or excluding risk from the project. This strategy is generally used in the situation of changing the purpose or in case of canceling a part of a project, situations that can cause great disruption in the estimated activities, and the expected final results. In these situations, it is considered an act of wisdom, on the part of the project manager, avoiding the risk of accepting such changes, which can lead to special problems.

3. Risks allocation. Risk allocation is not static. It is necessary to rely on the constraints of the public partner and it must be taken into account whether the allocation of risks is acceptable to investors. Thus, during the process of negotiating, the developed risk matrix for the specific public-private partnership project will be updated as a result of the negotiations/dialogue with the bidders. According to the above mentioned, the author has developed the following risk matrix.

However, there are some ways of indirect risk allocation, such as hiring a risk-management project expert, to assess or monitor the development of certain activities, in this way the project risk manager will transfer the risk administration to another person that is considered being competent in this domain. Another known form of risk transfer is the use of service contracts in projects (especially where sophisticated and/or expensive equipment are involved). Thus, the technological risk is transferred to the company that provides, for a fee, services for the proper functioning of the entire system.

*Systemic risk reduction* represents a complex of methods and strategies developed to reduce risks within an acceptable threshold for project managers. This strategy is based on the elaboration of a project plan, able to minimize the risks, at the level of the project development stages, based on the managerial options, resulting from the analyzes of the risk profile forecasts [1, p. 11].

*Risk monitoring* is the last stage of the risk management process and involves the use of the risk management plan and other tools throughout the activities. This process is based on choosing a set of indicators and monitoring their evolution, for the entire duration of a project. Plans for unpredictable situations emerged as an alternative to risk situations, by preparing a response strategy before their manifestation. In general, these plans focus on identifying response strategies in situations of financial risk (budget overruns, unforeseen costs) or technological risk (unforeseen breakdowns of installations or equipment, technological inaccuracies, etc). This stage has the aim to review and improve

Table 1

**Risks matrix associated with the investment project at different stages**

No.	Risks associated with the investment project	The responsible party	
		Private partner	State partner
1. Design stage			
1.1.	Risks associated with the project design	+	+
1.2.	Risks associated with the project terms	+	+
1.3	Risks associated with the project quotas modification		+
1.4.	Project errors	+	
1.5.	Administrative barriers resulted in the stage of project approval with state or municipal authorized bodies	+	+
1.6.	Risks associated with the land	+	+
1.7.	Corruption	+	+
2. Stage of construction and works reception			
2.1.	Guarantees and quality control	+	
2.2.	Compliance with building regulations and requirements	+	
2.3.	Increasing project costs	+	
2.4.	Construction terms extension	+	
2.5	Delays caused by the activities of governmental bodies, or local authorities	+	+
2.6.	The macroeconomic influence on the terms of construction	+	+
2.7.	Availability of raw material and human resources	+	
2.8.	Damages and losses caused by third parties	+	
2.9.	Contravention of safety and health regulations	+	
2.10	Bankruptcy or contractors insolvency		+
3. Operation phase			
3.1.	Risks associated with a possible revenue decrease	+	
3.2.	Failure in managing and exceeding operation costs	+	
3.3.	Technical risks regarding the object operation (hidden defects, maintenance, and repairs)	+	

Source: Developed by the author according to the [7]

the risk management plan, by constantly updating the information of it and by carrying out the routine controls to identify new risks or observe previously identified risk factors. The identified and assessed risks are registered in special databases or/and risk registers. They have various forms and fields, depending on the level of risk management implementation and the peculiarities of implemented projects. Generally, it must contain the following [2, p. 70]:

- list of risks grouped by categories;
- probability and estimated impact;
- activity that is subject to risk;
- the factors that can generate it;
- the person responsible for risk monitoring;
- response strategies;
- records regarding the estimated time of the event;

– the current situation of the response actions performance (this field is completed and updated as the project progresses).

We can specify that, although these risk reduction strategies have been approached separately, they are rarely used individually, the most used in practice is their combination, in order to use a complex strategy, able to provide, in due time, an adequate response.

Some risk response measures, such as assumption, control, and some issues of the risk allocation (e.g. quality assurance) require resource consumption. The quality and availability of the necessary resources can influence the process of choosing the response to risk, regardless of the potential rewards. Project management methodologies based on policies and procedures are very rigid.

Table 2

**Model of a risk register**

Nb.	Risk	Risk analysis		Risk level	Vulnerability analysis		Risk coordinator	Comments
		Impact	Probability		The existence of control points	Threats		

Source: Developed by the author according to [3, p. 78]

Most effective methodologies are based on general, indicative recommendations, which provide the project manager with significantly more flexibility in decision making. This flexibility may influence the choice of risk response method. Although there is still no empirical data to validate this, there seems to be a tendency for project managers to accept higher degrees of risk if the manager is left with greater freedom of decision. On the other hand, the rigidity of policies and procedures generally allows only lower levels of risk acceptance, and project managers seem to prefer the avoidance option.

**Conclusions and proposals.** In the unstable modern conditions, risk management occupies an extremely important place among the management mechanisms of PPP projects. A distinctive feature of the risk management system in PPP projects is a perception that the risks associated with the project should be borne by the partner, who can better control and manage them, which creates an incentive for efficient allocation of project revenues.

Risk mitigation strategies of a public-private partnership project are an important step in PPP risk management, which is done after identification, classification, and risk evaluation. This makes it possible to develop a management and risk-allocation system, which is best suited for a given project and

is impossible without the previous stages of risk identification and classification.

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