

## **COMPARISON OF BUDGET AND PPP MODEL IN FINANCING PUBLIC STRUCTURES IN POST-TRANSITION ENVIRONMENT**

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### **Abstract**

The main goal of this paper was to compare the application of a budget and a PPP model in financing public standard structures in post-transition environment. The analysis was conducted on education and sports facilities by applying the multiple-case study. The research and analysis of numerous public construction projects which were carried out in transition and post-transition social circumstances has shown the occurrence of characteristic risks. The trend in the Republic of Croatia indicates an even more intensive interest of the state for financing the public facilities by using the private capital. The progress and condition prognosis of future PPP projects in post-transition economies points out a possible occurrence of several of previously recognized characteristic risks. Those are risks which, although allocated on the private partner, can have a negative effect on the public partner as well.

### **Key words**

Budget model; non-commercial public structures; PPP models; public developer; public projects; risks

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## 1 INTRODUCTION

Financially challenging wide range of public needs in some countries is occasionally addressed by private capital investment into the public sector. This is usually called public-private partnership which is operatively implemented through several different models.

Public-private partnership can have its advantages over the classical public project finance model. The advantages are primarily related to covering financing costs and implementation and maintenance risks, that is, the structure availability and functionality by the private partner. In numerous countries with developed market economies a significant number of public structures have been constructed which were financed according to the public-private partnership model. For example, in Great Britain, the country which introduced the PPP model for delivering non-commercial public services named private financial initiative (PFI) in 1992, more than 830 projects of 78 billion Euro total capital value were implemented. In Canada about 190 projects of more than 54 billion Euro total capital value were implemented and in Australia more than 120 projects of more than 50 billion Euro total capital value. [1]

The Republic of Croatia and other post-transition countries have mostly been gathering their first experiences in this field. The differences in application experience, economic, social and other characteristics have resulted in the need of a different model application concept. It can be said that some post-transition countries have simply taken the model over and have been implementing it without adjusting it to their economic and social characteristics.

Past experience in public project implementation in the Republic of Croatia has shown a frequent occurrence of several risks [2, 3, 4, 5, 6, 7]. The research has also been conducted in other post-transition countries, Slovenia [8] and the Federation of Bosnia and Herzegovina [9, 10] where the same or similar risks were observed in public construction projects. The project contract time extension coefficients which were originally obtained by a developed mathematical model [4] recognize a poor construction project organization, incomplete project documentation and problems with contracting as the most significant risk factors. The experience from the implemented projects indicates that the occurrence of such risks can be related to the fact that such projects were implemented for a public developer and to the post-transition economic and social circumstances.

Primarily, the main goal of this paper is to compare differences and advantages of public structure projects in relation to the classic budget and the PPP model and present some recommendations of creating the necessary conditions for both models in relation to the established risks.

## 2 THEORETICAL AND METHODOLOGICAL RESEARCH FRAMEWORK

There are numerous definitions of the public-private partnership term. Usually, this term includes a synergy merger of resources, knowledge and activities of public and private sector in order to meet specific public needs. [11] Gulija [11] believes that “the term public-private partnership includes cooperative ventures where both the public and the private sector join resources and expert knowledge in order to meet a public need through adequate resource, risk and reward allocations.” According to the USAID Regional Infrastructural Program [12], PPP is “contractual agreement between public and private parties, in which both parties will receive significant benefits, whereby the private party perform some public function on behalf of the public party for a specified time and within a negotiated framework of transferred risk and outcome-based financial rewards”.

The references [11] point out PPP strengths to be a swifter implementation (because private sector is in charge of the design and the construction), reduced total costs (“the private sector is interested in reducing the costs during the whole project operational period, which is hard to achieve with the existing public sector management mechanisms”), a better risk allocation (one of the main PPP principles), a higher-quality service (“risk distribution should encourage the private sector to improve service quality”), more effective management, creation of additional income and other, depending on the PPP model.

In 1990s PFI (Private Finance Initiative) or DBFO (Design Build Finance Operative) model has been developed in Great Britain and has later spread into many European countries. Many public facilities (schools, hospitals, government buildings etc.) have been built using this financing model. The characteristic of this model is that the public partner pays the private partner a monthly amount of a contract-regulated fee during the whole contract amount duration time. This form of a contract is characteristic especially for non-commercial public facilities and is very complex in its provisions [13, 14].

The essence of a public-private partnership is the financial engagement of a private partner in public projects and risk allocation among partners. In classical public projects all the risk is carried by the public partner, which can be considered a significant advantage compared to the budget model. However, what should be kept in mind is that the PPP model is often subject to criticism due to the priority of the private partner for financial gain over public service quality as well as the potential hidden contracted costs for the public partner [15]. An inadequate contract and hidden guarantees given to the private partner present a special risk for the public partner [16].

To ensure the success of a project, it is important to foresee, as realistically as possible, the risks related to certain components and phases of the project and allocate them so that the balance ensures the best value for invested resources. The ideal risk-sharing solution is the one in which each partner takes over the risks he can best manage and total costs are thus minimized.” [13].

Also, key documents of the European Union, Guidance and Green Paper [17, 18], do not insist on strict methodology and policies of PPP contract implementations but offer recommendations and guidelines. Gulija [11] points out that “the EU regulations relating to the selection of the private partner at the Community level are coordinated to a different extent which can result in very different approaches at national levels.” PPP institutional and organizational empowerment of the public sector by using help of specialized organizations such as EPEC (European PPP Expertise Centre) and consistently implementing the VfM principles are important prerequisites for delivering better PPP projects [19].

### **3 EXPERIENCES OF PUBLIC STRUCTURE CONSTRUCTION PROJECT IMPLEMENTATION IN THE REPUBLIC OF CROATIA – THE LEARNT LESSON**

A long-term experience of public structure construction project implementation has indicated numerous problems occurring in the project preparation stage (conception stage – initiation), implementation stage, that is, design and construction stage and, finally, in the structure utilization stage [2, 3, 4, 5, 6, 8, 9, 10]. The Government of the Republic of Croatia also pointed out the majority of problems in its Framework program in 2012 [7].

Problems detected in the project preparation stage:

- The crucial technical standards and public structure quality standards are not matched
- The public developer generally does not entrust project management to professionals
- No pre-investment studies are made which could assess several possible project solutions and select the most optimal one.

Problems detected in the project design and construction stage:

- The public developer selects a design engineer through public bidding by the lowest-price criterion
- The design contract does not realistically set time and, often, price
- The project task which the public developer gives the design engineer does not determine all important characteristics of the future structure which are of importance in regard to its utilization
- A constant and systematic design (design solution) monitoring mechanism is neither set nor contracted by the public developer and therefore no timely intervention and correction can occur if required
- Particular design solutions are sometimes unjustifiably expensive, complex and non-functional to an unsatisfactory extent
- Incomplete designs, some project solutions are created not until the construction has started and the construction falls behind because of waiting for the documentation
- Usage of expensive, inadequate materials and equipment for the particular public structure
- Cost estimates which are part of tender documentation are sometimes incomplete with incompletely described items
- Selection of the cheapest contractor
- The contractors offer unrealistically low prices and count on cutting work quality down
- The supervising engineer is selected according to the lowest-price criterion
- Too short term in the construction contract.

Problems detected in the structure utilization stage:

- The structure routine maintenance costs are higher than expected
- The energy costs are higher than expected
- The necessary interventions on the structure due to the construction quality negligence occur already during the defects liability period and reduce or disable the structure functionality. The structure is not available for a maximum utilization of employee's work hours in order to carry out basic tasks and duties. [20].

The assessment of the Government of the Republic of Croatia from the Framework program can be quoted as the conclusion to the past way of implementing public investments into the public standard structures:

“The present public structure investment models have resulted in uneven standards, uneven quality and construction price. Moreover, the present investment models in these fields are not satisfactory, neither by their investment implementation dynamics, nor by quality and project costs which has resulted in cost overrun and discrepancies in public structure implementation.

Project management has been assessed as extremely unsatisfactory in all sectors as well as constructed public structure maintenance and management". The government also expresses its expectations that these problems will be resolved by public-private partnership implementation [7]. However, the reality is different. The very implementation of the model, without creating the necessary prerequisites, will not resolve these problems.

Besides the mentioned experience which has been analysed, monitored and recorded for a longer period of time [2, 3, 4, 5, 6, 8, 9, 10], a multiple-case study was additionally conducted for the purpose of this research. The goal of this study was a comparison of education and sports facilities constructed according to the classic budget and the PPP models in relation to costs, construction time and risks. The study included six structures in the Republic of Croatia, three of which constructed according to the budget model and three of which according to the PPP model.

#### **4 RESEARCH METHODOLOGY – MULTIPLE-CASE STUDY**

Experience from the previously mentioned research point out the following thesis:

Some of the risks which occur during the construction of public structures which were financed by the budget model are also present in construction financed by the PPP model. The investors and the final structure users are those who primarily suffer from these consequences. Even if the risks are allocated to the private partner, the public partner will not be entirely spared.

Methodology stages:

1. Case selection
2. Data source determination and data collection
3. Structure analysis and conclusions
4. Risk analysis and conclusions
5. Comparison of research conclusions and the set theory

##### **4.1 Case selection**

GROUP - BUDGET – Education facilities financed according to the budget model – 3

GROUP PPP – Education and sports facilities financed according to the PPP model – 3

##### **4.2 Data sources**

Interviews – Key participants (members of the management in charge of conducting business, heads of the accountant offices, heads and employees of technical service, users) were interviewed. In addition to answering the questions, the examinees were encouraged to express their opinions and make observations.

A semi-structured interview was conducted. Each examinee was not asked the same questions. The questions were made according to the examinee's professional profile, i.e., position within the system. The questions covered five fields:

- A) Position and role within the system
- B) Financial characteristics of structure utilization and maintenance
- C) Technical characteristics of the structure
- D) Observed structure utilization problems
- E) Observed structure maintenance problems.

Document study – documents provided by the examinees and documents accessible on web sites were used. [21, 22].

Direct observation – conducted for several structures by the researchers

#### 4.3 Structure data analysis and conclusions

An analysis of data collected through interviews and document study was conducted and appropriate conclusions, required to check the set thesis, were made.

#### 4.4 Risk analysis, advantages and conclusions

The most frequently recognized risks and advantages were stated. Appropriate conclusions, required to check the set thesis, were made.

#### 4.5 Comparison of research results and the set thesis

The set thesis is checked with the conclusions made from the research.

### 5 METHODOLOGY APPLIED ON SELECTED CASES

By applying the multiple-case study, the analysis included three education facilities which were financed from the budget funds and three education/sports facilities which were financed according to the PPP model and were constructed recently in the Republic of Croatia. The results are shown in Table 1 and Table 2. For comparison purposes, the calculated mean values are shown in Table 3.

The selected structures and data are shown in Table 1.

*Tab. 1: Structure data*

Model	No. of the structure	Purpose	Gross area (m <sup>2</sup> )	Capital value /€/	Value per m <sup>2</sup> /€/	Contracted deadline /years/	Duration of construction /years/	Deadline overrun /%/	Monthly costs /€/ (1)
Budget	1	Education	14,000	15,600,000	1,114	2.5	3.2	30	20,000
	2		21,000	21,340,000	1,016	2	3.5	75	30,000
	3		16,350	16,000,000	980	2.5	5	100	23,000
PPP	1	Education	14,000	11,000,000	785	1	1	0	117,000
	2	Sports	22,000	31,500,000	1,432	1.2	1.2	0	374,000
	3	Sports and education	2,600	2,100,000	800	unknown	unknown	0	13,000

Note: (1) Monthly costs for the budgeted model include overheads, maintenance and cleaning. For the PPP model these costs include utilization and maintenance fees.

Note: (2) VAT is included in all financial indicators.

*Tab. 2: Mean data*

Model	Purpose	Gross area (m <sup>2</sup> )	Value per m <sup>2</sup> /€/	Contracted deadline /years/	Duration of construction /years/	Deadline overrun /%/	Monthly costs /€/ (1)	Monthly costs /€/m <sup>2</sup> / (1)
Budget	Education	17,000	1,000	2.3	3.9	70	23,800	1.4
PPP	Sports and education	13,000	1,005	1	1	0	130,000	10+1 (3)

Note: (3) Depending on the PPP contract, additional payment of overhead costs by users.

## 5.1 Structure data analysis and conclusions

Structure data analysis according to the model of financing was given through the mean data model in Table 3.

A comparison of mean values from both models leads to following conclusions:

1. There is no significant difference between the two models regarding the capital value per m<sup>2</sup>.
2. Almost twice as long deadlines are contracted according to the budget model.
3. These contracted deadlines still have an overrun of even 70 %.
4. Monthly structure utilization and maintenance cost for budget structures is ca. 7-8 times smaller than the one for PPP structures. The cost also includes utilization fee (the rent).

It can be concluded that the financing model does not essentially influence the project capital value but has a great influence on project duration and utilization and maintenance costs due to specific provisions and regulations of PPP contracts.

## 5.2 Risk analysis, advantages and conclusions

The analysis of the structures in question as well as the experience from practice point to certain conclusions in relation to budget and PPP projects, the most significant of which are the following:

### BUDGET MODEL:

- Complex and demanding design solutions make the construction more expensive and longer.
- Design solutions result in the increase of energy and maintenance costs.
- The design solution contributes to the aesthetics, but not sufficiently to the functionality.
- The end user had no say in design solutions.
- The investor did not have sufficient influence on design solutions.
- Prior to designing the structure, standards and norms must be determined. General technical standards and conditions are insufficient.
- Construction deficiencies cause problems in structure utilization (water leakage, glass breaking, and damage to the façade, sound bridges, and the deficiencies in heating, air-conditioning and other).
- The contractor does not eliminate deficiencies timely and within the warranty period.
- The user must often pay for eliminating deficiencies by himself, even within the warranty period.
- The maintenance service performs maintenance regularly.
- Maintenance promptness and quality should be at a higher level.

### PPP MODEL:

- The design solution contributes to the aesthetics, but not sufficiently to the functionality.
- The end user had no say in design solutions.
- The investor did not have sufficient influence or could not influence design solutions.
- The design solution has increased energy costs.

- The design solution has caused utilization problems (break-through of water on lower floors).
- Prior to designing the structure, standards and norms must be determined. General technical standards and conditions are insufficient.
- Monthly fees are too high. The structure will be multiply overpaid.
- The financial advantage expressed in the Public Sector Comparator is the result of the stated risks and is quite questionable. The design, construction and supervision costs are the same for both models.
- Lack of funds in the private sector is used to unduly raise the fee.
- The user should not have to pay for overhead costs. The PPP contract should have defined the paying of overhead costs as the obligation of the private partner.
- The promptness and swiftness of eliminating deficiencies is satisfactory.
- With major deficiencies, the private partner utilization fee is reduced according to the PPP contract provisions.

The analysis has shown advantages and disadvantages of both models. An active involvement of the investor as well as the final user in budget model, that is, the public partner and the user in PPP model in all project stages is one of the means of achieving the desired project goals.

## 6 CONCLUSION

Regardless of the financing model, a risk of insufficient involvement and impossibility of the investor and the end user to influence the design solutions occur during the construction of public structures. Design solutions often tend to meet the aesthetic criteria rather than functionality. This partially results in the structure functionality deficiency. If there are no standards for a specific structure group, the risk of non-functionality is increased. Standards should be determined for each structure group.

The conclusions point to the need for greater involvement of investors and end users in the design stage in order to obtain a better functionality of the structure. One of the solutions is to hire expert consultants. The design contract should provide for such possibility.

Deficiencies in performance occur in both models. Disadvantages adversely affect the use of the structure. Appropriate criteria for selecting contractors and supervision are necessary for this problem to be solved.

The users are satisfied with the quality and swiftness of deficiency elimination and maintenance of PPP structures. Penalties for delays and a lack of access to specific parts of structures are deducted from monthly fees. In the budget model the users believe that the swiftness and the quality of eliminating the deficiencies should be better. The solution for the budget model lies partly in the proper management of the structure. In one aspect, this is a systemic problem which cannot be resolved without significant changes in the system. For example, Hall [15] is of opinion that "the quality and efficiency of public services depends on the workers delivering those services.

Their commitment and professionalism, sometimes called the 'public service ethos', are a key element in delivering those services. "

The fee for PPP structure utilization is very high. Therefore, the public partner multiply pays the private partner for the structure during the contractual period. The recession and lack of budgetary funds have increased the risk of overestimating the monthly fees.



Advantage in favour of the PPP model in the Public Sector Comparator is sometimes the result of risk analysis which is not explained accurately enough. The costs of design, construction and supervision are the same. The solution is in the actual, exact, and not furnished analysis and in objective examination and judgment of Comparator objectivity.

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