Construction Maeconomics Conference 2019

**elements of private and public sector participation model for construction**

Matej Bunat1

1 CTU in Prague, Thakurova 2077/7, Prague 6, 160 00, Czech Republic, matej.bunat@fsv.cvut.cz

Abstract

The paper deals with the construction project, especially its subjects. Each project always has several subjects that can be divided into two groups: public or private entities. The paper defines the project and the differences between private and public investor. Respectively differences between public and private construction contracts. The possibilities of cooperation of these two subjects are specified. The main part of the thesis defines conceptual elements for the model of financial intensity of participation of the private and public sector for construction. Each of these elements is characterized. The conclusion summarizes the findings of the issue. In addition, the element of the model for the financial burden of public-private participation is presented.

Keywords

Private sector of construction, Public sector of construction, Project, Public-private participation model

Introduction

Several subjects always enter the project. For construction projects, these are public or private entities or a group of them. One possibility is that the active entity is a public investor and the private entity is used only as the contractor of the project. A private investor may also be an active entity. At the same time, a public entity such as a building authority intervenes passively. Each subject has different objectives and needs for the project, both of which are listed in the paper. The most important part of the project for both parties is the cost of acquisition. For this reason, the elements of the model for the financial burden of public-private participation are presented below.

Construction project

The term project is defined according to ISO 100006 as: “A project is a unique process consisting of a series of coordinated and managed activities with start and end dates, performed to achieve a goal that meets specific requirements, including time, cost and resource constraints.” [1]

The construction project is a complex process, divided into three main phases (pre-investment, investment, operational). In the context of lifecycle thinking, it is necessary to consider the last phase, namely the destruction of the building. In each phase, management processes are distinguished, ie management of all phases of the construction project. The controlled process generally begins with selecting a site for construction. Subsequently, it continues with designing the building in the form of designing (project documentation). Furthermore, the process of project implementation starts according to the project documentation. Last but not least, it deals with the operation of the construction in the future.

Fig. 1: Phase of construction project (source: author)

Different forms of organization of construction project management are used, which are realized by project management. In particular: quality management, time, cost and resources, financial management, procurement incl. contract management, human resources management, risk and change management.

Investors of construction projects

From the investor's point of view, it is possible to differentiate the types of construction contracts according to the source of financing into public and private contracts. It is typical for public contracts that the investor is the state. Alternatively, the investor may be a delegated authority of the state administration and self-government institutions (regions, municipalities) or other organizational units of the state. Private contracts can be divided into individual and business orders. Individual contracts are those where the investor is usually natural persons who do not carry out the contract within the scope of their business activities. On the other hand, for contracts within the business sphere, investors are private individuals (natural or legal) who execute the contract in the course of their business. [2]

Public contracts

Public contracts are awarded by the contracting authority. The subject of the contracts is the provision of supplies, services or works financed from public budgets for consideration. A public contract is any contract that is executed on the basis of a contract between the contracting authority and one or more suppliers. Furthermore, the clear process of public procurement, including its course, is regulated. [3]

Public construction contracts represent a significant part of the demand for construction production. They account for about 25-40% of the total range of construction output. Their decrease respectively. growth significantly affects the dynamics of total construction output, construction companies' economy, especially in the field of engineering construction. The largest public contracting authority in the Czech Republic in recent years was the Road and Motorway Directorate, Railway Infrastructure Administration, state organizations. [4,5]

The size of the public sector depends on many factors, in particular: government economic (economic) policy, economic factors, historical factors, demographic factors, geographical factors. These and many other factors ultimately influence the specific structure, form and extent of the public sector in each individual country. [6]

Examples of public sector contracts: Schools, kindergartens, offices (construction, work, city…), Water authorities, Public flats, Public infrastructure, Libraries, Transport, Police, Sports halls, etc.

Private contracts

A key position within the structure of the national economy is occupied by the private (business) sector, which affects the public sector by the amount of tax revenue, e.g. income tax, value added tax or real estate tax, but also the amount of health and social insurance contributions. it also affects the balance of payments due to imports and exports. The business sector also has a significant impact on the non-profit sector of households, where it affects the unemployment rate in the region as a result of job creation. This also means the level of income of the population and thus their purchasing power. The non-profit private sector also has a significant impact, thanks to the sponsorship of non-profit organizations. The business sector consists of business entities, it is a set of companies. [7]

The legislation of the Czech Republic does not regulate the course of contracts that are financed from private funds. Methods and goals are set by the investor at his own discretion. The main objectives of the private investor are maximizing the market value of the company, maximizing the benefits of business owners and maximizing profit as a surplus of revenues over costs (Formula 1).

Individual functional sections ensure maximum profit: maximizing revenue (sales), minimizing costs. Examples of private sector contracts: apartment buildings, office buildings, shopping center buildings, etc.

$CF\_{n}=R\_{n}-C\_{n}-T\_{n}$ (1)

where CFn = economic result in the nth year

Rn = revenue in the nth year

 Cn = cost in the nth year

Tn = taxes in the nth year

Public-private cooperation

The difference between the private and public sectors is mainly in the definition of the law. The public sector has clearly defined individual processes and results. All its procedures are supervised and controlled. A private investor can choose projects and suppliers at his own discretion, but must proceed within the framework of the law, pay the correct taxes, etc. The differences between sectors (Fig. 2) are summarized in the next three characteristics. These are the primary role, responsibility and self-responsibility, success criteria, client and funding.



Fig. 2: The differences between public and private sectors (source: author, indicate [7,8])

It is also possible to use private implementations in the public sector. The differences between sectors have already been clarified. There is also the possibility of cooperation between the two sectors. One possibility is to use PPP projects. Another possibility of cooperation is the creation of grant programs from public funding to increase efficiency and quality. The public sector is making use of this possibility, especially for sustainable development. In contrast, the public sector uses grant programs such as the EU for more efficient sustainable development. One of the possibilities of support is the regeneration of brownfield, which is advantageous for municipalities.

Public-private participation model

Each construction project must undergo an approval procedure according to valid legislation. The investor, public or private, will elaborate the construction documentation in the given details specified by law or by the regulation of the given municipality. The documentation describes the construction including its location and possible connection to the public infrastructure. Each municipality has developed a territorial and regulatory plan. According to [9], spatial planning is defined as interdisciplinary activity, which allows equal cooperation of engineers in the field of geodetic work, construction, transport planning, water management planning, architects, biologists, environmentalists. None of them is superior to another, in an ideal state it should be a perfect cooperation of all subjects.

The project can be implemented without any problem if it is in accordance with the land-use plan, the law, including all specifying regulations and competent authorities. As far as the private sector is concerned, the procedure is simpler because it is not regulated by law and it is only up to the investor how he chooses the supplier and can start building the construction. Private sector funding may be a major problem. The investor either owns sufficient funds or can use a bank loan. In contrast, the public sector annually defines the funds to be paid for a given year and determines the number of projects accordingly.

The private, public or cooperation sectors must always consider the total cost of construction. The total cost of the construction project is not only the construction costs of the buildings themselves, including the costs of the construction site. The total costs will be increased by other elements, which are illustrated in Fig. 3. In the case of a private investor project, not all costs fall into its budget. But in the case of construction, in some cases, the public budget must also intervene. The greatest burden on the public sector occurs in the case of extension of utilities, construction of new roads for the purpose of connection to the construction. However, the operation of these costs in the future must also be taken into account. In some cases, the private sector of a given network can build from its own resources, but it is precisely the future operation that will be a public sector concern. Further, you can find in Fig. 4, an illustrative percentage of the financial demands of individual elements on the entire construction project.

Elements of the model

Fig. 3: The list of elements of the Public-Private Participation Model (source: author)

Land price

For any construction project, it is important to ensure ownership of the land on which construction is planned. One possibility is that the investor already owns the land. Another possibility is that the land has to be purchased. The last option is that the public sector will offer its land for construction to a private investor through a contract. The contract defines under what conditions it will be possible to build on the land and the relationship between the public and private entities.

Building objects and construction site equipment

The most comprehensive element in the module is Building Objects (BO). Most publications refer to basic budget costs. BO are technically or spatially separate parts of the building that have a clearly defined function. BOs include all acquisition costs, including materials, prescribed tests and inspections.

Other costs that must be taken into account are the costs of locating the building. These are mainly related to the construction site equipment (connection of the construction site to water, electricity, facilities such as offices for building management, space for technical supervision, dressing rooms, washrooms, occupations, warehouses, landfills, in-site roads, fencing, etc.). Furthermore, this item takes into account territorial influences and extremely difficult working conditions.

Design and exploration work, engineering

In order to be able to exhibit any construction project, all documentation necessary for the construction will be carried out. These include the preparation of the contract, the design of the construction study, preparation of project documentation (planning permission, building permit, construction, commissioning), selection of contractor, cooperation in the construction of author and technical investor supervision, cooperation on completion of construction and commissioning.

Building equipment (machines, inventory etc.)

An integral part of the project may be equipment of the object. It is also possible to complete the construction project without equipment. This element includes equipment such as furniture, special equipment. It includes the cost of its acquisition, including transport, installation and installation costs.

Financial costs, interest, bank fees, Corporate Governance

Another element is to consider the cost of any interest, bank charges or other costs that the investor raises money to pay for the project if it does not have equity to pay. Other costs may be the costs of Corporate Governance, which is the system through which the company is managed and controlled. The system defines the distribution of rights and obligations among stakeholders in the company, such as shareholders, executive management, statutory bodies, employees and customers, or other stakeholders. It is a set of legal and executive methods and procedures that primarily oblige publicly traded companies to maintain a balanced relationship between the company and those who make up it. [10]

Marketing costs, rental or sales agents

Another element to consider is the cost of marketing or paying the agent for arranging the sale or lease of the building. If it is planned to rent or sell parts of the construction project, the investor must issue advertising costs. If he would not have expended the costs most likely, he would not have a buyer and therefore would not benefit from the project. This element is not necessary for every construction. In the case of a public body in particular, this item is zero.

Tax costs, real estate transfer tax, Title insurance

Another element for the model is to include tax and insurance costs. These are mainly taxes (real estate tax, etc.), levies and fees. Insurance of the property owner in case of legal defects in the acquired property is also envisaged.

**Engineering networks (water, energy, telecommunications etc.)**

Another element for the construction project is the cost of building a sufficient public technical infrastructure. It is usually owned by a public entity, which is also responsible for its operation in the coming years. In the absence of a contract between a public and a private entity regulating this part. Another possibility is that the construction of the necessary infrastructure will be ensured by a private entity, but the operation will be taken care of by a private entity. These are mostly the provision of water supply, sewerage, gas, electricity, telecommunications, etc.

**Communication and public transport**

Providing communication for both public and private transport is another element. In case that there is not enough distance to connect to the construction of the village sufficient communication for the public, including the construction of urban transport stop and subsequently its operation. Again, there is a possibility of agreement between a public and a private entity where a different relationship will be defined. However, the result is again to ensure the operation of the public entity, including adjustment and renewal.

**Public space (e.g. public greenery, lighting, park)**

Last but not least, the construction project involves the possible construction of a public space, ie public greenery, public lighting or the construction of a park. Other elements may be the construction of new public buildings, such as new offices for a new part of the municipality, schools or kindergartens. The construction of new buildings is regulated by law.

**Other, not included in other elements**

The last element of the model is other costs that are not included in the other elements. One of the possible costs may be a reserve. It is necessary to consider especially in case of increased risks during construction. Furthermore, it may be the cost of patents, geodetic work, setting out construction at the beginning of construction, or use of modern technology.

Fig. 4: Illustrative burden of total costs of individual elements of public-private participation model (source: author)

Conclusion

There are innumerable differences between a private and a public entity when it is considered an investor. As illustrated in the article, each entity has different goals of the construction project. While the interest of a public entity is a public benefit. A private entity sets a target as the profitability of its project. There is still a variant of public-private cooperation. The relationship of the entities and the requirements are always defined by the contract. An advantage may be a better distribution of risk among contractors, as the risks are transferred to the partner who is able to better manage these risks. It is reducing the cost of project risk. Another advantage may be that the state allows the implementation of cooperating projects and thus the entry of public funds into the private sector. It also indirectly supports the employment of the population. A disadvantage may be the entry of a private entity itself. If the relationship conditions are not set correctly. The essence of a private entity is to generate profits, so if it is not sufficiently motivated to improve performance, the whole project will become uneconomic.

Furthermore, elements of the model have been identified and must be taken into account in the new construction project. Even in the case of construction by a private entity, there may be a financial burden on the public entity. The public body must analyse whether the construction will benefit. An integral part of the analysis should be its financial consideration of all elements. Further consideration should be taken into account, including the consideration of the long-term investment, i**.**e**.** the operation of the project and all its components.

Acknowledgements

This work was supported by the Grant Agency of the Czech Technical University in Prague, grant No. SGS19/007/OHK1/1T/11.

References

1. DOLEŽAL, Jan, Pavel MÁCHAL a Branislav LACKO. Projektový management podle IPMA. 2., Praha: Grada, 2012. Expert (Grada). ISBN 978-80-247-4275-5.
2. TOMÁNKOVÁ, Jaroslava a Dana ČÁPOVÁ. *Management staveb*. Praha: FinEco, 2013, 225 s. ISBN 9788086590127.
3. Act No. 183/2006 Coll., On urban planning and building regulations (Building Act).
4. *Stavebnictví České republiky 2017*. In: Praha: Ministerstvo průmyslu a obchodu, 2017. Available online at: https://www.mpo.cz/assets/cz/stavebnictvi-a-suroviny/informace-z-odvetvi/2018/2/Stavebnictvi-2017\_final.pdf
5. ČSÚ. Stavebnictví. *Český Statistický Úřad* [online]. [cit. 2018-07-20]. at: <https://www.czso.cz/csu/czso/stavebnictvi>
6. BLAŽEK, Jiří, Alena KERLINOVÁ a Eva TOMÁŠKOVÁ. *Ekonomika veřejné správy*. Brno: Masarykova univerzita, 2016. Učebnice Právnické fakulty MU. ISBN 9788021080409
7. TETŘEVOVÁ, Liběna. *Veřejný a podnikatelský sektor*. Praha: Professional Publishing, 2009. ISBN 9788086946900.
8. Tang, L., Shen, Q. and Cheng, E. (2010). A review of studies on Public–Private Partnership projects in the construction industry. *International Journal of Project Management*, 28(7), pp.683-694.
9. PFAUNTSCH, R. Der Ingenieur als Stadtplaner. In: *Městský inženýr - městský architekt*. Praha: Grand, 2017, ISBN 978-80-87438-88-6.
10. SEEN SOBEREIGNTY M. Some Critical Remarks on the Genealogy of Governance In: Journal of European History of Law, London: STS Science Centre, ISSN 2042-6402.