

# SELECTION OF QUANTITATIVE AND QUALITATIVE METHODS FOR COMPREHENSIVE EVALUATION OF PPP PROJECTS FOCUSING ON THE CZECH REPUBLIC\*

Petr JÍLEK  
Hana ČERNÁ SILOVSKÁ  
Petr KOLAŘÍK  
Martin LUKAVEC

## **Petr JÍLEK**

Ing. Ph.D., Department of Regional Studies,  
Faculty of Economics and Administration,  
University of Economics, Prague, Czech Republic  
Tel.: 00420-22-409.5518, E-mail: xjilp05@vse.cz

## **Hana ČERNÁ SILOVSKÁ**

Ing. Ph.D., assistant professor, Department of Regional  
Studies, Faculty of Economics and Administration,  
University of Economics, Prague, Czech Republic  
Tel.: 00420-22-409.5624, E-mail: hana.silovska@vse.cz

## **Petr KOLAŘÍK** (corresponding author)

Ing. Ph.D., Department of Regional Studies,  
Faculty of Economics and Administration,  
University of Economics, Prague, Czech Republic  
Tel.: 00420-22-409.5518, E-mail: xkolp29@vse.cz

## **Martin LUKAVEC**

Ing. Ph.D. student, Department of Regional  
Studies, Faculty of Economics and Administration,  
University of Economics, Prague, Czech Republic  
Tel.: 00420-22-409.5518, E-mail: xlukm902@vse.cz

\* **Acknowledgement:** This article was written with the financial support of the Internal Grant Agency at the University of Economics, Prague, within the project F5/69/2017.

DOI:10.24193/tras.54E.3  
Published First Online: 2018/06/29

## **Abstract**

The article deals with the theoretical background and concepts providing the basis for the use of forms of financing and acquisition of public goods and services through partnerships between the public and the private sectors (public-private partnership – PPP). The aim of this article is to introduce a new original methodology using a selection of qualitative and quantitative methods for evaluating investments and to form a complex output that will clearly and distinctly testify about the appropriateness of using the PPP method. For this purpose, processes which are normally used for business valuation – generators of values, property valuation, yield valuation, valuation based on market analysis, are combined and incorporated/recast in the current assessment methodology, which is based on the Public Sector Comparator and determinants of value for money (VFM), are being used. Although this new methodology was developed in response to the problematic situation regarding PPP projects' evaluation particularly in the Czech Republic, it can also be applied in other countries.

**Keywords:** public private partnership, value for money, Public Sector Comparator.

## 1. Introduction

The possibility of benefiting from co-operation between private and public sectors opens new dimensions for investment opportunities of the public sector and enables the implementation of projects which would not be, under normal circumstances, possible to realize, either from financial, technological or knowledge reasons. Cooperation based on a partnership brings, in case of realistic expectations, a mutually beneficial situation which could replace in the future the realization of projects using standard public contracts (Nijkamp, van der Burch and Vindigni, 2002).

The general awareness of PPPs is still quite low among both researchers and practitioners, at least within the Czech Republic. At the same time, it is possible to argue that, in case of a correct application, it brings the intended results (Bovaird, 2004). This type of cooperation is most commonly used in the execution of projects such as road constructions, building bridges, hospitals, sport centers, prisons, etc. (Zaato and Hudon, 2015; Zou, Wang and Fang, 2008).

The first country where PPP projects started to be implemented was the United Kingdom, with more than 200 projects currently providing high quality public services. Other countries where PPP projects are successfully implemented are France, Spain, Portugal (see Figure 1) and e.g. Canada. No project has been implemented yet in the Czech Republic. The method used to evaluate them can be one of the reasons for this.

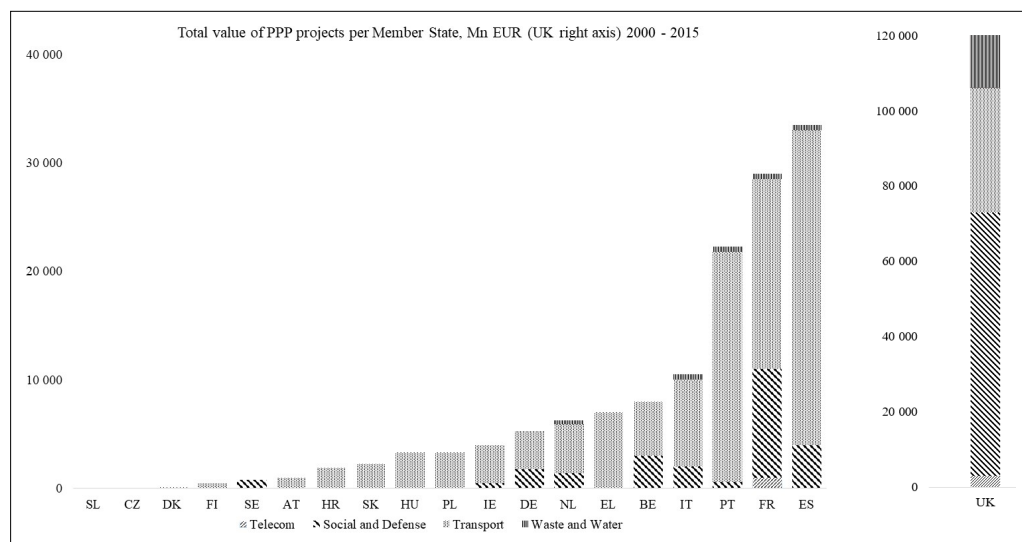


Figure 1: Total value of PPP projects per Member State, 2000 – 2015

Source: Tomasi (2016)

The expected outcome is to ensure minimization of expenditures on public services and infrastructure from public budgets. This should be enabled by the already mentioned cooperation with the public sector (Boardman and Vining, 2007).

One of the main attributes of the transparency resulting from market mechanisms is the financing of such projects. Provided that there is a presence of financial exposition of both the public and private sectors in a project, also financial institutions (banks, financial cooperatives, insurance companies, etc.), which in almost 100% of projects interact with a private partner in PPPs, are becoming a part of the game. The reason for that is the well-known economic principle of financial leverage that improves the profitability of the own project capital. Therefore, it is very sad that, in spite of all the advantages of PPPs and all the successful projects realized in Europe, only a negligible number of such projects have been implemented in the Czech Republic (Ehrenberger, 2014). The answer needs to be sought in the early stages of pre-development and project preparation. According to statistics, a majority of projects have not been finished not because of unsuitability of the PPP processes but due to inability of public and private subjects to find a common action and mainly a goal which should be fulfilled. More precisely, they have not been able to make a qualitative and quantitative evaluation that would be comprehensible and could satisfy both parties.

Nowadays, a method called Value for Money (based on the Public Sector Comparator) for evaluation of suitability of the PPP projects is being used. Unfortunately, only a few projects at the municipal level (but not a single project on the national level) have been proceeded since the existence of this methodology. The output of this methodology is, however, only the Net Present Value, which is a static simple indicator that does not reflect the complexity of a PPP project. Private sector needs other important information such as profitability of own capital. To improve this aspect, the authors, when studying a value assessment of property, have developed methods of value assessment of work facilities where the outputs of assessment are precisely defined and most importantly, the parameters, with which the aim can be reached, are precisely given. This article assumes that a PPP project can be considered as an enterprise unit. This assumption is supported by the fact that PPP projects are in 99% of cases SPV (special purpose vehicle), i.e. special project companies with a standard status of a trade corporation (most commonly stock companies or limited liability companies). In this case, the authors of this article were able to apply and examine the methods of valuation of such business units which will be modified for cases of providing public goods and which will be complemented with modified versions of PPP evaluations based on VFM.

The main aim of this article is to create a new methodology of evaluation of PPP projects which would better reflect both partners' requirements for a decision on whether a particular project brings appropriate money value for both parties, which is proportional to the risk involved. The baseline is an assumption that the current methodology, serving a contracting entity, does not bring results which would be effective when deciding whether a project is suitable for a PPP or for a normal public procurement procedure.

This methodology is expected to replace the current methodology created by Ministry of Finance in cooperation with Ernst & Young and issued as a recommended

procedure for the realization of PPP projects. Qualitative and quantitative methods that were used are a combination of standard methods used for business valuation and were modified in order to be used in PPP projects. The methodology should therefore help the public contractor, who will know if a commissioning of a project at a given time is favorable, under which conditions is a project economically favorable, which risks are contained in a project and how are they quantified, who is the ideal partner after the final evaluation of costs, benefits and discount rate. If the public contractor, on the basis of this information, decides to realize such a project, he will know an exact value of his investment at any time. He will also be able to know, for instance (also thanks to an assets sharing in business premises) an amount of life-cycle-cost at a given time. He can also know if it is possible to sell a part of his assets which are no longer needed because it is obsolete or superfluous and get additional incomes of the project. For the private partner this methodology brings a clear view on the SPV as on a standard business unit with a business plan which is based on particular economic indicators and on a preliminary estimation of the value using value generators.

The article consists of three main parts, introduction and conclusions. The first part explains basic consequences concerning PPP definition and is primarily focused on the introduction of evaluation methods, technics and indicators currently used in the Czech Republic (but also in most of the other countries using PPP). The key second part is devoted to the new methodology of PPP evaluation, where the process is presented step by step. In the following part several crucial findings, resulting from the methodological process, are summarized.

This article has primarily a methodological character. This fact results from the main goal. At this stage, the new evaluation method is explained in detail and its advantages, compared to the currently used one, are discussed. The aim is not to apply this new process on a selected PPP project within this article. There are reasons for this decision – mostly caused by time and extent constraints. As this methodology has just been developed and the discussion about its future application has just started, it is highly desirable to pay close attention to the methodology itself first. The next logical step would be to apply the process to a certain PPP project. This will happen in the future, but a separate article will be needed for this demonstration as the process includes many steps and it needs large coverage.

The methodology of the article is based particularly on collection and exploration of existing methods used in the discipline of business evaluation. These methods have been combined and applied to the area of PPP evaluation in order to create a new original methodology. This approach has been applied for the first time within these issues.

## **2. PPP projects and the methods for their evaluation**

There is no unified definition of PPP. For instance, OECD (2012) defines PPPs as a type of contracts where a private investor provides services and infrastructure which are usually ensured and provided by the public sector. According to Ostrřížek *et al.*

(2007), the PPP is a contracted partnership of public and private sectors which leads to ensuring of public infrastructure and services and using of abilities of the both partners by the most suitable allocation of resources, responsibilities, risks and related incomes.

Therefore, it may be considered that the PPP is essentially a type of long term contract of provision of goods and services (Zaato and Hudon, 2015). This type of partnership is in most cases concluded between representatives of both the public and the private sectors. The private sector most commonly is comprised of a consortium of a number of companies such as banks, suppliers, technical experts, etc. Then, the PPP contract covers a proposal, realization and ownership of the subject-matter of the contract (Koppenjan, 2005).

One of the characteristics of PPP projects is a concept of risk-sharing where the general principle is that the largest degree of risk is being borne by the project participant that at the same time has the largest share on the project's management (Bovaird, 2004). Therefore, PPP projects enable risk-sharing in a way in which each partner takes on such part of the risk that he is able to manage (Pârvu and Voicu-Olteanu, 2009). However, it is necessary to mention that a number of existing sources put into question the capability of real risk distribution (Froud, 2003; Hodge, 2004; Flinders, 2005; Broadbent, Gill and Laughlin, 2008).

These advantages of PPP projects can be mentioned (Brzozowska, 2006): opportunity for small investments; possibility of implementing further public investments; savings from public budgets; transfer of new technologies; risk sharing; significant competition on the market; guarantees regarding the functioning of services in the longer horizon; reducing of the political influence on the economy; greater transparency in the economy. But there are also some disadvantages (Brzozowska, 2006): limited influence of public institutions on the overall form of the investment; increase of charges to users of the infrastructure; reducing of the influence and bargaining positions of public bodies; high transaction costs; reduction of the quality of services; limited availability of services; reduction of number of public sector jobs; the financial risk for a commercial partner; high cost of lost opportunity on the side of the commercial partner; the political risk for a commercial partner.

VFM is the currently used basic criterion (principle) for decision about a PPP project. It represents the total socioeconomic benefit related to the project's costs. It is based on both quantitative and qualitative perspectives. Quantitative terms reflect overall financial flows, especially the project's costs. Delivery time, quality of services, project sustainability, etc. represent the qualitative perspective of evaluation. Usually, the result is expressed as percentage (PPP centrum). Qualitative indicators contained in VF can hardly be expressed statistically, therefore financial data is being analyzed more frequently. Financial analysis that observes economic favorableness of a PPP project is based on a model of Public Sector Comparator (PSC). The PSC model is a tool that informs the public sector about the flow of total costs, revenues and risks during the whole life cycle of a PPP project. The whole methodology of the PSC mod-

el is described in Hess (2016), however, it can be summarized that its final output is the indicator Net Present Value (NPV). Then, the project is beneficial only when the value equals more than zero.

Another methodological tool used for PPP evaluation in many countries can be mentioned – the so called Reference Project that serves as an inspiration for decisions about a similar new project. Unfortunately, in the Czech Republic there are basically no such reference projects at the moment, so this tool is unusable.

To summarize, evaluation methodologies of PPP projects are based on a comparison of net present values of PSC and PPP. Although, NPV is generally considered to be a dynamic method of investments' evaluation, their overall view on final project is very rigid, because it observes only how to discount financial flows and it ignores other important elements such as the assumption of 'going concern' that can be used also for public goods. Among other such elements are included setting of the discount rate, market development's prognosis, etc. All these parameters are included in the business valuation. This discipline can help to modify/complete current methodology of PPP evaluation.

### **3. New methodology of PPP evaluation**

For an efficient decision making not only of the public contractor but also of the potential private partner we propose a new procedure of PPP projects' evaluation. It is a combination and modifications of selected methods of business valuation. In combination with the amended method of the Public Sector Comparator and the PPP model, it is a proposal for a standardized proceeding that should contribute to a clearer decision on whether it is favorable to realize a project in the form of a classic public procurement or a PPP. Therefore, the comparison of both models (PSC and PPP) will not need to be used, as these models have in reality a different structure of inputs, outputs and the methodology applied. Therefore, it is very difficult to reach an objective conclusion on which of the options is the most favorable.

Assumptions of the new PPP methodology:

- A PPP project is seen as a business company;
- Assumption of a going concern of a PPP project;
- Discount rate is calculated, instead of being set by legislation;
- Assumption of an equity deposit of a private partner (in every form);
- SPV has only one basic determination for which it is made;
- For quantitative and qualitative PPP projects' evaluation purposes, this article is based on the category of market value since a majority of goods and services being provided in this form function on the principle of market mechanisms;
- This article is based on the definition of business according to the European law. As an integral part of the PPP, the public sector should be regarded, from the resulting valuation point of view, also as a business unit;
- Determination of value will be based on the definition of the level of business NETTO, as this level will show the future value for the contractor and for the future (co)owner of a service or good;

- The business unit is in an expansion (establishment of a firm) or a crisis stage. In case the business unit would be in a stabilization stage it is not economically efficient for the public sector to involve a private partner;
- Quantifiable risks enter directly into the discount rate of a project.

Within the framework of the recommended methodology, we will distinguish between two basic scenarios. The first scenario is the existing SPV, which should be transferred into the PPP model. The second one is a creation of a new SPV PPP project, i.e. a completely new company. The new calculation consists of five steps:

- Analysis of data entries;
- Financial condition of SPV;
- Generators of value of a PPP project;
- Financial model of PPP;
- DCF method for PPP.

### ***3.1. Data entry and analysis***

Quality of valuation is proportional to the quality of data entries. Therefore, an analysis of data entries must be furthermore divided into steps and should progress from broader consequences to a SPV structure, financial plan and to a final figure of valuation. It is also important to have a sufficient number of information on whether and in which form it is reasonable to realize a project. The market, on which the targeted SPV will be placed, should be specified during the first stage. Its project size, derived from sales and consumption amount, further prognosis of the project (ideally a time-series analysis expressed in value or material units) should be determined. It is also important to distinguish between the so called tangible and intangible market growth. Another important thing is to have information on average market profitability, possible substitutes for a particular service or good and on the structure of potential customers. The last step should comprise an identification of possible risks and market access barriers. During the second stage it is necessary to identify a company that will cover the project. A precondition is to create a new SPV without previous problems. In case an existing company is used, it is necessary to carry out a financial, tax, legal or, as the case may be, technical due diligence. The most suitable form for the creation of a company should be analyzed, i.e. its legal form (in most cases it is a joint stock company or a limited liability company but in case the IPO or bonds emissions are considered, the joint stock company is the more suitable option), a subject of entrepreneurship, shareholding. Then, a management structure should be created. It should be proportional to the shareholdings of the public and private partner, i.e. it is not always necessary that a public partner owns a majority. For instance, also a minor shareholder can initiate a force sale (in case of a breach of a Joint Venture Agreement or a proven uneconomical management).

### ***3.2. Financial condition of SPV***

In the case of an existing company, it is necessary to initiate an analysis of its financial situation using ratio indicators. Such an analysis should (contrary to the standard procedures) be carried out also in the case of a new SPV. This step will be conducted only in the process of a new valuation conducted after the creation of a financial plan, where it will result in the control of economic reasonability of an intention of providing a service or good. The following indicators of the new methodology of the PPP valuation have been selected:

- Liquidity indicator;
- Financial balance indicator;
- Capital market indicator;
- Profitability indicator;
- Activity indicator.

For a complete initial evaluation of a PPP project, using an analysis of a company to which the project is 'inserted', a test using the Altman model is optimal. This model is included in the so called bankrupt models which serve as an early warning that a business is not economical. A majority of these models are based on real data of companies which went bankrupt or, on the contrary, have been very profitable. It goes without saying that unpredictable situations may occur, which can, without any previous signs, immediately put a company into insolvency. However, for our purposes, in the stage of valuation of the financial condition of a business, the Altman model seems to be very appropriate for a fast control of the future development of the SPV. The Altman formula has a degressive character of confidence over a given time. Nevertheless, according to statistics, the confidence over a two-year period is at the level of 95%.

In the situation that a PPP project will be realized in an existing company an exclusion of non-operational assets will be made. Ideally, using this dividing method, the necessary operational assets are transferred into a new company. In practice, it is, however, from various reasons, not always possible, since non-operational assets are considered as assets without a direct relation to the main activity (e.g. around 20% in industry). From a valuation point of view it is necessary to separate all assets related costs and revenues. These assets are taken into account only during the final stage, when they will be individually valued and added to the final value of evaluation. If such assets exist and if they are excluded, also the final position of a company will be deducted by revenues and costs related to those assets. Using this procedure the so called corrected position (profit) of a company is obtained, which will play a crucial role in the final valuation of the business entity.

### ***3.3. Generators of value of a PPP project***

Generators of value are most commonly used following the revenue valuation methods having a considerable influence on its final value. We mention these generators shortly again: margins and their growth, margin of operational profit, invest-



ment into operational working capital, investment into operational fixed assets, discount rate, method of financing of the business unit. Based on the British analysis, which was developed by the National Audit Office (Bourn, 2003), the main factors have been identified as having a significant impact on the final VFM of the PPP projects. In particular (MFČR, 2011): risks allocation, specification of outputs – services, long-term operations, measuring of performance and motivation, competition, ability of private sector to manage a project. These factors can also be described as generators of value. For illustration, both groups of generators are shown in Table 1.

**Table 1:** Comparison of generators of value

<b>Generators of value of business events</b>	<b>Generators of value of PPP projects</b>
Sales and revenues growth	Allocation of risks
Operating profit margin	Output specification
Investment in working capital needed	The long-term
Investment in fixed assets necessary	Performance measurement and motivation
Discount Rate	Competition
The method of financing	The ability of the private sector to manage the project
The length of the project	

**Source:** The authors

As seen from Table 1, at first sight, these generators do not correspond in neither from to the mentioned cases. Generators differ in particular in their essence of measurability. All generators of business units are of a quantitative character whereas ‘generators’ of PPP projects are mostly of a qualitative nature. This is one of the main reasons why it has not been possible yet to create a quality evaluation of a PPP project from the perspective of a public contracting authority that would correspond to the needs of a private partner. Nevertheless, after a deeper analysis, it is possible to adjust these generators. The first factor of PPP generators that can be unambiguously used in the valuation is an allocation of risks. All risks, in a standard PSC expressed as a cost item, that decrease real money flow should be directly included into the discount rate in such a way that problems are avoided when the risk materializes and affects the level of costs. If the risk is directly involved into the discount rate, every time interval of the project will include this risk. In the long term, certainly, a better use could generate business units where a project period is exactly stated. Measurement of performance is solved within an analysis of financial soundness of the SPV using the ratio indicator or the Altman model.

### **3.4. Financial model of PPP**

If we want to distinguish the currently used methodology of PPP projects’ evaluation and replace it with a new methodology that is understandable for both the contractor and the private partner, we must also create a financial plan that is understandable for the both parties as well. The only possibility regarding how to achieve this is to create a plan on the basis of financial statements which are clearly understandable for the parties involved – financing institutions included. Using this ap-

proach we can also avoid the currently used needless comparison of both models (comparison of PPP and PSC models). Within a standard business unit managing (thus also the SPV) these statements are used in many areas – for managing of a company as basis for communication with tax administrations and auditors. It would, therefore, be very efficient to create an implementation prognosis of a PPP development into these statements. In the previous step of the methodology the main items were planned with an essential influence on a SPV performance. These items will be the basic building block of the financial model. To create a complete financial model on the basis of financial statements it is necessary to complement this ‘basis’ of a financial model with the following ‘reinforcements’:

- Financial plan – i.e. planned ration of outside and own capital, anticipated structure of credits. This plan should be a part of an offer of a potential private partner that is currently tendering a PPP project.
- Plan of costs and profits not related to a basic activity – these items will be valued separately outside the main plan. It is, however, necessary to consolidate and plan them as well.
- Payments of dividends and profits according to business shares in SPV. The scheme below shows the sequence of actions of the methodology from compiling an analysis to creation of a financial plan in the form of planned financial statements.

Figure 2 illustrates a procedure of the new evaluation methodology. The particular planning basis and the methods leading to the final procedure of this scheme can naturally be different and their detailed analysis is not a subject of this article. After the creation of the plan we are approaching the valuation itself on which basis a value at a particular date is set. The valuation is based on the assumption that uses discount money flows, i.e. DCF Equity.

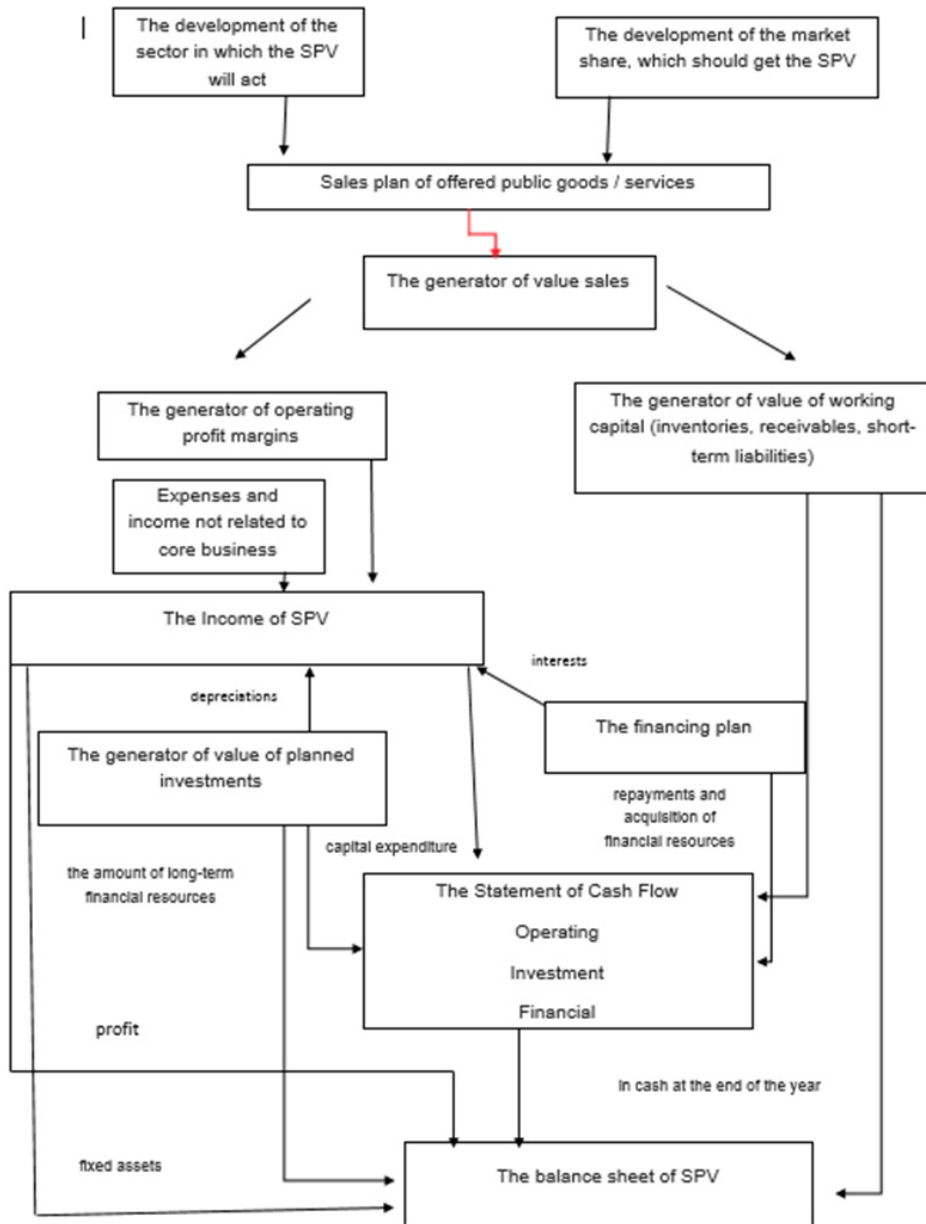
### 3.5. DCF method for PPP

The DCF method can determine a PPP project value at a particular arbitrary time. This period should reflect the contractor’s need that the contract length makes clear the potential of a PPP project according to the public contractor. It is necessary to mention that using the DCF equity method (that we use) we calculate directly the own capital value based on the FCFE (Free Cashflow to Equity) basis (i.e. cash flow for owners). We will use a so called two-stage method of valuation (Mařík, 2007).

For calculation of DCF equity we will use the following formula:

$$H_d = \sum_{t=1}^T \frac{FCF_t}{(1+i_k)^t} + \frac{PH}{(1+i_k)^T}$$

where T is the length of the first phase in years,  $i_k$  is a discount rate at the cost of equity (at the entity level WACC), PH is the ongoing value. Ongoing value or the value of the second phase can be calculated using the Gordon or parametric formula.



**Figure 2:** Procedure of the new evaluation method

**Source:** The authors based on Mařík (2008)

Gordon's formula has the form:

$$PH = \frac{FCF_{T+1}}{i_k - g} = \frac{FCF_T \cdot (1+g)}{i_k - g}$$

Even though in the Czech Republic it is the most widely used method to calculate the ongoing value, compared to the parametric formula it is a significantly simplified formula from which we can derive the relation to the parametric formula, which for our purposes is much more efficient because it is based on the value generators that are specified in the previous steps. Of the generators we focus on the profitability of investments and the return on equity and we quantify the relation between two generators. The parameter pattern is therefore based on these two generators' values:

- Profitability of necessary operating invested capital:

$$r = \frac{KPVH}{K}$$

where K is the necessary operating invested capital = operationally necessary fixed assets + operating working capital and KPVH has been mentioned a few times a corrected operating profit.

- Profitability of net investments:

$$ri = \frac{\Delta KPVH}{In}$$

where  $\Delta KPVH$  is the increase/decrease in the adjusted operating income, IN net investment which is defined as the addition of invested capital:  $In = K_t - K_{t-1}$ ; ie. the sum of net investment and depreciation, then the result is achieved gross investment (I b):  $Ib = In + O$ .

The rate of investment (mi) is seen here as a percentage of the adjusted operating Net profit, which is a PPP project applied to other net investment:

$$mi = \frac{In}{KPVH}$$

The growth rate (g), which is also used in the Gordon formula:

$$g = \frac{\Delta KPVH_t}{KPVH_{t-1}} = \frac{\Delta FCF_t}{FCF_{t-1}}$$

Substituting therefore to Gordon formula created a formula for the parametric model:

$$FCF_{T+1} = KPVH_{T+1} - In_{t+1} = KPVH_{T+1} \cdot \left(1 - \frac{g}{r_i}\right)$$

$$PH_t = \frac{KPVH_{T+1} \cdot \left(1 - \frac{g}{r_i}\right)}{i_k - g}$$

The result of this valuation will be the anticipated value of a PPP project at the end of a contract, under certain quantitative and qualitative assumptions, that a public

contractor should submit as a so called reference project. The same name is intentional in this case since an ideal 'made-to-measure' case should be used instead of a case taken from another project. The public contractor grants this project to potential private subjects as part of the tender documents. Then, potential private partners only carry out stress analysis within all the previous steps, mainly within a strategy analysis and financial plan. Ratio indicators and Altman's model serve as a control mechanism verifying whether limit values of project efficiency are not reached. The EVA method (economic value added, for more see Kislingerová, 1999) that has been selected as a second valuation method is used (as well as in cases of a standard valuation) as a control method. It is appropriate in this methodology, as well as in standard valuation procedures, for reasons of control, to use two inputs. The advantage of the EVA and DCF methods is that they come from the same data sources, i.e. from amended financial statements among which is, in our case, also the financial model. Thanks to the EVA method we can, apart from a control calculation, also get additional information which is impossible to have using only the DCF method. Such information is, for instance, the finding in which year is the value that contractors demand, fully restructured, although the mechanisms of both methods enable us to come to the same result.

### ***3.6. Practical use of the new methodology***

Practical use of a methodology arises from the financial model itself. Thanks to the modelling on the basis of financial statements – balance sheet, economic outturn cash flow – and a model of financial analysis, we can revise any step described in the new methodology in a particular year. The project can therefore be suitably amended in order to be as efficient as possible. Furthermore, the statements are understandable for a majority of subjects interacting on the market, including financing institutions that are almost indispensable in PPP projects. The new methodology can, thanks to the particular simulations, give information on which form of PPP is suitable for a particular project. It is possible, for instance, to amend mandated performances (item performances) of individual partners in order to optimize the level of operational costs in different years. Modification of this item in the profit and loss statement has an immediate impact on the cash flow statement and balance sheet and subsequently into the financial analysis where we can clearly see how the ratio indicators are affected. From these sources it is also possible, for instance, from the different years (from history as one of more information sources) to find out the amount of operational capital that enters into the valuated price of a joint venture. Financial analysis is directly connected to the statements and it evaluates, using ratio indicators, the financial condition of SPV. Naturally, particular changes in statements affect also the generators of value used for an initial valuation. These generators can be therefore contained directly in different years and the value of a company can be calculated in different years.

Concerning the financial analysis and its ratio indicators, it can be stated that based on the profitability of own capital the project will most probably not be financed by any potential private partner since the profitability in comparison with opportunities currently on the market cannot make the project competitive. Contrary to a standard method of valuation where a value connected to a certain date is primarily determined, it can be said, without exaggeration, that if there is a need, any form of exit in any year can be simulated. Thus, the advantage for the public sector is that, within the standards used on the market, it can simulate before launching a tender different forms of partnerships and exits in particular years to ensure the projects fit timely, financially, and strategically into relevant developing documents.

Based on the model, the simplified value of a project in different years can be easily calculated according to value generators. Furthermore, it can be easily tested in which year is the highest value of a project for both partners. This leads us to one of the effects for the public sector – to open new sectors for this cooperation and efficiently work with public sources.

#### **4. Results and discussion**

As expected, the use and modification of the methodology of valuation of business units for PPP projects appears to be very appropriate, in particular on the grounds of transparency and comprehensibility of the outcomes. The methods of valuation of business units are frequently used in praxis and have a demonstrable history. Selected methods based on discount cash flow are at first sight similar to the method of a net present value; however, when making a comparison on a more detailed level, it can be clearly said that they have a higher and more relevant ability to anticipate the future project value. The private partner can use this value as a springboard and using a stress analysis it can simulate the profitability of a project at its entry parameters.

The new methodology is based on a net value level, by reason that the net value shows for the (co)owner of a SPV the future value of a business unit. The methodology uses a hybrid category of value that stems from theoretic definitions of valuation of business units. It is a so called category of market objective value since a vast majority of goods and services provided in this form function on the principle of market mechanisms and also since it is a public good, the value should be clearly reviewable. From all of the valuation methods used in praxis in business units, the most suitable for a PPP project are those methods based on benefit analysis that reflect the potential of a PPP project on the basis of free 'dismountable' cash flows. These methods also show the prognosis of a business unit into the future.

The advantage of the new methodology, contrary to the one currently used, is that it evaluates the price of a PPP project on a basis of qualitative and quantitative methods. Another advantage of this methodology is that every year not only provides outcomes for further procedures of the methodology, but also proceeds from the most important aspects to a detailed financial analysis. This means that in case of

a negative outcome in every stage of the methodology we can consider such project as inappropriate for the PPP option or inappropriate for realization as a whole.

The new methodology is very efficient particularly in case of an incentive approach to PPP projects when the private sector is motivated for providing a public service or good in such a way that the public partner realizes its payment for accessibility of less than 100% of the total equity exposition of the private partner. Such private partner has the possibility to make commercial use of the service or good and make profit in such a manner that he gets back not only the rest of the equity but also the premium which represents the profit of a project. Subsequently, this profit level should be adequate to the level of risk that the private subjects undertake. According to the new methodology, the risk should be taken into consideration in a discount rate and should not be quantified up to a certain level (current application). The number of years over which a private subject will provide a public service or a good should not be the fixed entry of the contractor, but vice versa, an outcome that stems from calculation using methods of discounted cash flows. Also the proposed percentage amount of total investment costs, which a public subject paid in the form of availability payments to a private partner, should constitute a result of the analysis from the perspective of both the public and the private sector, within offers of the public entity where this value can become a significant criterion when assessing the most advantageous offer.

## **5. Conclusions**

The main aim of this article was to create a new method of evaluation of PPP projects, which would better reflect the requirements of both partners to decide whether the project provides both sides with the adequate value for money, which is directly proportional to the risk incurred. The current situation of PPP projects in the Czech Republic was and is the fundamental reason for setting this goal. Presently, PPPs are, unfortunately, used in the Czech Republic very sporadically, more or less only at the municipal level. None of the pilot projects at the national level have been implemented yet. There are many reasons for this, from displeasure of politicians to realize PPPs instead of the standard public procurement, where corruption is facilitated through ignorance of the issue, to the discrepancy of expectations between the private and the public sector. The latter issue mentioned conceals one of the main reasons why PPPs fail even in the pre-development phase. Methods of the project evaluation are, according to the current methodology, limited to the basic comparison of the net present value of the two, often completely different, financial models, and is therefore very difficult to find the intersection between economic demands and expectations of the private partner that operates on market principles and the public partner (contracting authority) that doesn't have too much experience with market mechanisms and principles. The discount rate in the public sector is today fixed by regulation. It makes the objective evaluation and the entry of a private partner in the project, again, very difficult. The method of Public Sector Comparator is very rigid and does not

analyze the potential of the project, which is one of the most important attributes (if not the most important) for the decision of a private partner to cooperate on a PPP. For example, Public Sector Comparator completely abstracts from the analysis of the existing assets of the SPV, which can make the project more expensive and can reduce the final value for money. Furthermore, PSC lacks any analysis of the condition of the SPV, which the PPP project will implement. This work presents the possibility of a new method for the valuation of PPP projects based on methods of valuation of business companies.

According to the authors, the new PPP method is applicable to all types of industries, and can include strategic projects such as important transport hubs, technical infrastructure and the like. The primary benefit is that the public partner will have, in the joint venture, the control majority and will have the opportunity, in case of any inefficiency imaginable, to pull the emergency brake.

The application of this new method depends on the future discussion with interested authorities, especially the Ministry of Finance. The authors expect that at a time when there is a huge excess of liquidity in the global economy, the public sector will act responsibly and possible joint ventures with minority public-sector participation will consist mainly of commercial plants based on the Czech capital. It is not only a new methodology, but the change of the system involved in the management of public resources.

#### References:

1. Boardman, A.E. and Vining, A.R., 'Can P3s Contribute to the Upgrade of Canada's Asia Pacific Trade Infrastructure?', Phelps Centre for the Study of Government and Business, Sauder School of Business, 2007.
2. Bourn, J., 'PFI: Construction Performance', National Audit Office, 2003, [Online] available at <https://www.nao.org.uk/wp-content/uploads/2003/02/0203371.pdf>, accessed on April 15, 2016.
3. Bovaird, T., 'Public-Private Partnerships: From Contested Concepts to Prevalent Practice', 2004, *International Review of Administrative Sciences*, vol. 70, no. 2, pp. 199-215.
4. Broadbent, J., Gill, J. and Laughlin, R., 'Identifying and Controlling Risk: The Problem of Uncertainty in the Private Finance Initiative in the UK's National Health Service', 2008, *Critical Perspectives on Accounting*, vol. 19, no. 1, pp. 40-78.
5. Brzozowska, K., *Advantages and Threats of Public-Private Partnerships in Larger Infrastructure Projects*, Warsaw: CeDeWu.PL, 2006.
6. Ehrenberger, M., 'Cost Planning of PPP Projects in the Czech Republic', master thesis, Charles University in Prague, 2014.
7. Flinders, M., 'The Politics of Public-Private Partnerships', 2005, *The British Journal of Politics and International Relations*, vol. 7, no. 2, pp. 215-239.
8. Froud, J., 'The Private Finance Initiative: Risk, Uncertainty and the State', 2003, *Accounting, Organisations and Society*, vol. 28, no. 6, pp. 567-589.
9. Hess, J. and Hromada, E., 'Komparátor veřejného sektoru' (Public Sector Comparator), 2016, [Online] available at [http://www.metrostav.cz/cz/aktuality/aktualni\\_informace/detail?id=1012](http://www.metrostav.cz/cz/aktuality/aktualni_informace/detail?id=1012), accessed on April 1, 2016.



10. Hodge, G.A., 'The Risky Business of Public-Private Partnerships', 2004, *Australian Journal of Public Administration*, vol. 63, no. 4, pp. 37-49.
11. Kislingerová, E., *Oceňování podniku* (Business Valuation), Prague: C.H. Beck, 1999.
12. Koppenjan, J.J.F.M., 'The Formation of Public-Private Partnerships: Lessons from Nine Transport Infrastructure Projects in The Netherlands', 2005, *Public Administration*, vol. 83, no. 1, pp. 135-157.
13. Mařík, M., *Metody oceňování podniku: proces ocenění – základní metody a postupy* (Business Valuation Methods: Valuation Process – Basic Methods and Procedures), Prague: Ekopress, 2007.
14. Mařík, M., 'Ostatní metody stanovení hodnoty podniku' (Other Methods of Determining the Value of an Enterprise), in Harumová, A., *Stanovenie hodnoty majetku* (Determination of Property Value), 2008, Bratislava: IURA Edition, pp. 378-409.
15. MF ČR (Ministry of Finance of the Czech Republic), 'Hodnota za peníze – metodika' (Value for Money – Methodology), 2011, [Online] available at [http://www.mfcr.cz/cps/rde/xchg/mfcr/xsl/rr\\_ppp\\_metodiky\\_postupy\\_44473.html](http://www.mfcr.cz/cps/rde/xchg/mfcr/xsl/rr_ppp_metodiky_postupy_44473.html), accessed on April 10, 2016.
16. Nijkamp, P., van der Burch, M. and Vindigni, G., 'A Comparative Institutional Evaluation of Public-Private Partnerships in Dutch Urban Land-use and Revitalization Projects', 2002, *Urban Studies*, vol. 39, no. 10, pp. 1865-1880.
17. OECD, 'Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships', May 2012, [Online] available at <https://www.oecd.org/governance/budgeting/PPP-Recommendation.pdf>, accessed on April 20, 2016.
18. Ostřížek, J. et al., *PPP: příležitost a výzva* (PPP: Opportunity and Challenge), Prague: C.H. Beck, 2007.
19. Pârvu, D. and Voicu-Olteanu, C., 'Advantages and Limitations of the Public Private Partnerships and the Possibility of Using Them in Romania', 2009, *Transylvanian Review of Administrative Sciences*, no. 27E, pp. 189-198.
20. Tomasi, M., 'Public Private Partnerships in Member States', Brussels, March 2, 2016, [Online] available at [ec.europa.eu/economy.../03\\_tomasi\\_presentation\\_on\\_en.pdf](http://ec.europa.eu/economy.../03_tomasi_presentation_on_en.pdf), accessed on November 20, 2017.
21. Zaato, J.J. and Hudon, P.A., 'Governance Lessons from Public-Private Partnerships: Examining Two Cases in the Greater Ottawa Region', 2015, *Commonwealth Journal of Local Governance*, no. 16/17, pp. 12-30.
22. Zou, P.X.W., Wang, S. and Fang, D., 'A Life-Cycle Risk Management Framework for PPP Infrastructure Projects', 2008, *Journal of Financial Management of Property and Construction*, vol. 13, no. 2, pp. 123-142.