

# “The development of methods of calculating the concession fees”

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# THE DEVELOPMENT OF METHODS OF CALCULATING THE CONCESSION FEES

## Abstract

Developed and advanced way of calculation concession fee than provided by the Government Methodology from 04.02.2016. It based on the critical review of existing legal regulation in Ukraine, considering the inflation factor according to international requirements (UNIDO). This approach provides a reduced risk of members of concession agreement, protection of the project member's interests and the financial viability of the project. Ukraine should follow international practice and rely on concession fee as an instrument of regulation, not only as a fiscal instrument. During the concession contest, where the criteria for selection of the winner is a concession fee, the Government should provide the object to concession if the amount of the payment will be higher than the maximum profit that can get a monopoly. Fee may take the form of a single or an annual payment. In the latter case, reasonable discount rate must be set to calculate the present value of the stream of payments. Confirmed: the need pre-planning examination of normative documents, the use of sentences of the international experience of evaluation of projects, the revised rate of interest a concession payment, the desirability of calculating asset values using their average annual cost, taking into account the special conditions of the project.

## Keywords

methodology, concession, fee, payment, inflation, cost, rate, income

## JEL Classification

E65, G28, H54, L32

## INTRODUCTION

Present consultants, who are working on reforming relations in concessions for the infrastructure projects implementation, present their proposals to representatives of the European Bank for Reconstruction and Development (EBRD). This is only first step towards beginning massive concession reform of legislation, which provides for the harmonization of legal regulation in Ukraine to the best international practices and modern international standards. Renewed legislation will attract powerful international and Ukrainian investors to modernize and rebuild the national infrastructure. This will allow Ukraine to create new objects of road, port, energy and municipal infrastructure that will meet international quality standards, will help create new work places and activate the process of economic growth in the country.

From a legal standpoint, concession legislation reform involves the development of a new modern law of concession by combining the best provisions of the current laws of Ukraine which regulate realization of concession activity in different industries. These changes envisage harmonization of corresponding relationships with a legislation about state-private partnership taking into account the best international experience, in particular, legislations about public-private partnership.

While preparing governmental documents, it is necessary by means of specialists to conduct their front examination. Such measures give an opportunity to avoid enough material errors, and improve a legislative process. After the loss of the action of existing methods for a certain time (1; 8), it follows to analyze operating methodology (5).

## 1. ANALYSIS OF RECENT RESEARCH

The concession approach in investing in the large-scale projects has many advantages compared with traditional models, but there remain problems associated with the peculiarities of the transformation of the economy. Only few experts have a complete understanding of future impacts of concessions.

Buxbaum and Ortix (2007) outline the social problems associated with the concessions, describing their relationship between public and private sectors, reaction of the public and offering key questions that need to be considered in future.

Hanaoka and Palapus (2012) specify a reasonable period of concession, which would be beneficial both to government and the private sector given the risks connected with the market situation taken into account in the financial assessment using modeling and game theory in the negotiations.

In a continuation of the previous experts, Nasirsadeh, Khanzadi, and Alipour (2014) consider a concession period one of the most important decision variables in the organization of the concession contract, which must be defined taking into account existing risks and uncertainty caused by inflation. They conclude that a longer concession period is more beneficial for the private investor, whereas a prolonged concession period may result in the loss of public investment.

Also, the rational interval of the concession, on the basis of which specific period concessions can be obtained through negotiations between the two parties, are considered in the work by Shen and Wu (2005). They propose the stochastic model of concession period for infrastructure processes, which takes into account the impact of risks and the attitude to risk of the private investor and the government.

A number of scholars focus their attention on the opportunities and strategies required to obtain concessions for the exploitation of infrastructure of the seaport. Pallis, Notteboom, and De Langen (2008) assess the extent to which concession procedures create entry barriers and exit and reduce the competitiveness of the market, consider the relevant empirical materials completed or intended concessions in major European ports to evaluate these issues. Earlier Notteboom (2006) determined that through concession policy port authorities can retain some control over the organizational and structural supply side on the market ports and can encourage providers of port services to optimize the use of scarce resources such as land. Ferrari and Bosta (2009) offer an alternative definition of fees.

Solutions to the various contentious issues in the development of the concession in relation to transport are reflected in the works described below.

Rye and Scotney (2004) studied the influence of system design, public transport demand in relation to demand and supply price for services. Stiller (2010) investigated the influence of the state and investment policy, which he analyzed using the concession approach based on cause-effect relationships. Vassalio (2006) evaluated the mechanisms reducing the road risks in highway concession projects, and preventing the revision of the concession contracts.

Wyman, Barborak, Tnamder, and Stein (2011) considered tourism as a viable financial option for protected areas. They determined that a concession for tourism through partnerships with the private sector gaining selections, allowing to keep the overarching goal of biodiversity conservation.

Whereas concession procedures and related capability requirements create entry barriers for newcomers, a policy aimed at reducing these barriers, according to the scientists, can have a value. They also believe that appropriate initiatives should

address such questions as the optimal duration, prices and business processes; a clear definition of rules of inter-firm competition is an understatement “strategic factors” to win concessions, and ignored in the present practices of existing firms in recent years of the concession period and details to market also deserve attention.

## 2. IDENTIFICATION OF AN UNSOLVED PROBLEM

According to the Law of Ukraine “About concessions”, a concession is a right for building or exploitation of concession’s object on requiring payment and urgent basis on condition of taking by the stakeholders to commit itself to building or exploitation, property responsibility and entrepreneurial risk. Ownership of the property, which is created, reconstructed and improved by a concessionaire from his own resources, remains at the state or the local community. The concessionaire commits cost recovery by earned profit. That is the definition of concession in Ukrainian legislation coincides with the generally accepted definition of concessions in the narrow sense. But Ukrainian legislation lays on a limit on the agreements of concession through establishment of term of concession and obligatory concession fees. Therefore, concession fee in Ukraine is not an adjusting instrument, but is a fiscal instrument. Also unstable macroeconomic and regulatory environment that increases political and market risks is the main barrier for investments in concession projects.

Formulation of the research aim is an improvement of “Calculation method of concession fees”, approved by the Cabinet of Ministers of Ukraine according to international standards and taking into account the inflation factor.

Growth speed at this time is so high and the inertia of thinking is so strong that economics is in many cases simply not kept pace with the changes occurring in the object of analysis. As a result, there is a conflict between out-of-date theories and new reality, a statement about the system crisis of economic theory appears. In this case, the question is about our traditional attitudes, national economy and current trends in regional economies.

## 3. PRESENTATION OF THE RESEARCH RESULTS

Ukraine was a peaceful country and experienced the quite good periods of economic development. Ukraine was the world’s tenth largest gross domestic product when it had become independent in 1991. Now Ukraine is in a crisis. In the context of the fate of Donbas, then sooner or later it nevertheless will be the part of Ukraine again. There is a destroyed economy, the new contemporary and modern with the latest technology must be built.

We still do not understand what happens in Ukraine uncontrollable territories today. For example, according to environmentalists, considerable part of Gorlovka’s mines (and they are all very deep within kilometers) are flooded, water already rose 700 m. This means that there are a few steps away the technological disaster. The neutralization of these negative phenomena requires a lot of money.

There are several possible options. First, there must be created a road infrastructure, and then communications must be built. It follows to build modern industrial parks, clusters there. Something can be done on concessionary terms, and something – through public investment. A concession is a grant of rights, land, mineral resources, property, other objects by a government in exploitation to the foreign firms or entrepreneurs under certain conditions with the aim of rebuilding and development of national economy and natural resources (Zavhorodnii, 2007). There are areas of state responsibility and business responsibility. For example, roads, communications, education, medicine are the area of responsibility of the state. Then there it will be necessary to attract the business. One of the options involves the creation of a special insurance fund to alleviate the specific risks. If business will come, there would be workplaces, but simultaneously it would be necessary to solve the problem of accommodation and providing qualified personnel. However, Donbass could repeat their fate, if again will become a powerful industrial core of Ukraine.

But there are the amendments to the Cabinet of Ministers of Ukraine Regulation No. 639 “About claim of the calculation method of concession fees” as of April 12, 2000 in the center of this research (Brealey & Myers, 1997).

According to the methodology, it was offered to choose one of three methods of calculation of concession fees for concessor taking into account the sphere of economic activity where the object of state or municipal property is granted.

1. The concession fee for the right to property management of entity should be viewed as part of value of object granted in a concession on the results of its evaluation conducted in accordance with certain legislation about the assessment of property rights and professional valuation activities, and should be calculated by the formula:

$$K_{pe} = \frac{B_f \cdot X}{\bar{i}} (\%), \quad (1)$$

where  $B_f$  – value of the granted object in concession, that is, adjusted on the index of inflation for corresponding period;  $X$  – concession fee rate, %;  $n$  – reporting period.

In which

$$B_f = B_b \cdot I_k, \quad (2)$$

where  $B_b$  – a value of the estimated or re-evaluated object granted in a concession;  $I_k$  – an inflation index from the date of estimation or reevaluation of granted to the concession object to the moment of calculation concession fee for the reporting period.

*Comment 1:* it is not enough to adjust the value of the object granted in a concession  $B_f$  only on the index of inflation  $I_k$ . It is better to use an interest rate

$$r = I_k + R + p - e - l, \quad (3)$$

where  $R$  – risk insurance, %;  $p$  – a premium for participating in the project to the concessionaire (it is determined by the results of the concession);  $e$  – a discount for abandonment from production;  $l$  – a discount for increased project liquidity.

The main components of the formula (3) can be specified based on previous preplanned researches (Hanaoka & Palapus, 2012) through independent experts and can be proposed to concession.

The minimum rate of concession fee  $X_{\min}$ , by this methodology (2) should be calculated by the formula:

$$X_{\min} = \frac{D_{ma}}{ZP_{mp}} (\%), \quad (4)$$

where  $D_{ma}$  – an arithmetic mean value of proceeds of products or services for three previous years;  $ZP_{mp}$  – an arithmetic mean value of residual value of capital assets in the field of economic activity, where the object of state / municipal property granted three years before the conclusion of the concession agreement in concession.

The residual value of capital assets is determined as the mean value of the residual value of capital assets at the beginning of the reporting period and the residual value of capital assets at the end of the reporting period.

*Comment 2:* net profit from products or services for three previous years should be determined by the formula of compound interest and bring the conclusion of the concession agreement to the date:

$$\begin{aligned} Df_{(-3years)}^p &= Df_{(-3years)} \cdot (1 + I_m^{pl})^3, \\ Df_{(-2years)}^p &= Df_{(-2years)} \cdot (1 + I_m^{pl})^2, \\ Df_{(-1years)}^p &= Df_{(-1years)} \cdot (1 + I_m^{pl})^1, \end{aligned} \quad (5)$$

or:

$$\begin{aligned} Df_{(-3years)}^p &= Df_{(-3years)} \times \\ &\times \left[ 1 + I_{(-3years)} \cdot (1 + I_{(-2years)}) \cdot (1 + I_{(-1years)}) \right], \\ Df_{(-2years)}^p &= Df_{(-2years)} \times \\ &\times \left[ 1 + I_{(-2years)} \cdot (1 + I_{(-1years)}) \right], \\ Df_{(-1years)}^p &= Df_{(-1years)} \cdot (1 + I_{(-1years)}), \end{aligned} \quad (6)$$

where  $Df_{(-3years)}^p$ ,  $Df_{(-2years)}^p$ ,  $Df_{(-1years)}^p$  – accreted value of net profit from products or services for three previous years and brought to the date of the conclusion of the concession agreement;  $I_m^{pl}$  – average value of inflation for three previous years to the conclusion of concession agreement (for example, in 2013–2015:  $0.5\% + 24.9\% + 43.3\% = 68.7\%$ ,

$I_m^{pl} = 68.7\% / 3 = 22.9\%$ , according to the State Statistics Service of Ukraine);  $I_{(-3\text{years})}$ ,  $I_{(-2\text{years})}$ ,  $I_{(-1\text{years})}$  – an inflation for each of three previous years to the conclusion of concession agreement, respectively, for example,  $I_{2013} = 0.5\%$ ,  $I_{2014} = 24.9\%$ ,  $I_{2015} = 43.3\%$ ;  $Df_{(-3\text{years})}^p$ ,  $Df_{(-2\text{years})}^p$ ,  $Df_{(-1\text{years})}^p$  – net profit from products or services for three previous years and brought to the date of the conclusion of the concession agreement.

It is not exactly to similarly determine the residual value of capital assets  $ZP_{mp}$  as the mean value at the beginning of the reporting period. Should be used the formula of the average annual value of capital assets by the formula:

$$\begin{aligned} ZP_{(-3\text{years})} &= ZP_{pr(-3\text{years})} + \frac{BF_{in}^3 \cdot M_{in}^3}{12} - \frac{BF_{out}^3 \cdot M_{out}^3}{12}, \\ ZP_{(-2\text{years})} &= ZP_{pr(-2\text{years})} + \frac{BF_{in}^2 \cdot M_{in}^2}{12} - \frac{BF_{out}^2 \cdot M_{out}^2}{12}, \\ ZP_{(-1\text{year})} &= ZP_{pr(-1\text{year})} + \frac{BF_{in}^1 \cdot M_{in}^1}{12} - \frac{BF_{out}^1 \cdot M_{out}^1}{12}, \end{aligned} \quad (7)$$

where  $ZP_{(-3\text{years})}$ ,  $ZP_{(-2\text{years})}$ ,  $ZP_{(-1\text{year})}$  – a value of an average annual value of capital assets in each of three previous years;  $ZP_{pr(-3\text{years})}$ ,  $ZP_{pr(-2\text{years})}$ ,  $ZP_{pr(-1\text{years})}$  – value of capital assets entity at the beginning each of three previous years;  $BF_{in}^3$ ,  $BF_{in}^2$ ,  $BF_{in}^1$  – an imposed capital assets in each of three years;  $BF_{out}^3$ ,  $BF_{out}^2$ ,  $BF_{out}^1$  – taken out of production capital assets in each of three years;  $M_{in}^3$ ,  $M_{in}^2$ ,  $M_{in}^1$  – the number of full months to the end of the year, when entered capital assets will work;  $M_{out}^3$ ,  $M_{out}^2$ ,  $M_{out}^1$  – the number of full months to the end of the year, when entered capital assets won't work.

At the same time, value of capital funds should be adjusted by the formula (7) on the inflation index based on revaluation process.

In the same way, we will take into account the factor of inflation in a formula (4) (and it is in conditions of Ukraine's economy is very meaningful). This required by international methodologies of assessment of the effectiveness of projects. Calculating the cost of capital assets in the field of economic activity by an average annual values should to do very approximate. This calculation requires a more reasonable approach suggested

above (Vassallo, 2006).

2. Next method is offered in Cabinet of Ministers of Ukraine methodology (5) offers to calculate the concession fee by the formula:

$$K_{pl} = D_{net} \cdot X + F_{pl}, \quad (8)$$

where  $D_{net}$  – net profit from realization of concession (realization of products/services) for reporting period;  $X$  – the concession fee rate, %;  $F_{pl}$  – the amount of the fixed concession fee.

*Comment 3:* net profit in the formula (8) should be determined by requirements of international standards (UNIDO methodology) (Shen & Wu, 2005) by the formula:

$$D_{net} = \sum_{t=1}^{t=T} \frac{(\overline{CF})_t}{(1+r)^t} - \sum_{t=1}^{t=T} \frac{(C_0)_t}{(1+r)^t}, \quad (9)$$

де  $(\overline{CF})_t$  – financial result in the year  $t$ , calculated without initial investments;

$\sum_{t=1}^{t=T} (\overline{CF})_t / (1+r)^t$  – return of capital (primary investments): the amount of financial results of CF from the year to year from the date of the first investments;  $(C_0)_t$  – seed money (original capital) in year  $t$ , beginning from the date of investment;

$\sum_{t=1}^{t=T} (C_0)_t / (1+r)^t$  – invested capital (seed money);

$T$  – concession period (years);  $r$  – can be determined by the formula (3).

Here are some comments to the formula (8): the special terms of concession are not taken into account, i.e., an economic rent. Economic rent is a special type of rent in the form of an additional profit earned by the entrepreneur, due to reduced costs per production unit compared with other manufacturers (Zavhorodnii, 2007). Also determination of Brealey and Myers (1997) is suitable: "Profits that more than cover the cost of capital are known as economic rents". In our researches, we are taking into account particular conditions of investment-innovative projects implementation. For example, take into account the effect of hidden disposal of capital assets (when there is no opportunity to place new effective capital assets on the places of the enterprise's "old" capital assets) (Notteboom, 2006).



3. The third method determines the calculation of concession fee by the formula:

$$K_{pl} = \frac{B_f \cdot X_1}{n} + D_{net} \cdot X_2(\%), \quad (10)$$

where  $X_1$ ,  $X_2$  – rates of concession fee, %.

*Comment 4:* see comment 1 to the formula (2) in relation to an index  $B_f$  in relation to an index  $D_{net}$  – see comment 3.

4. The calculation of concession fees for the right to establish a new object is determined by the formula:

$$K_{pl} = D_{net} \cdot X + F_{lp}. \quad (11)$$

*Comment 5:* see comment 3.

The materials in this study were used in the process of large planned events the following signif-

icant investment projects initiated strategies for economic and social development of Odessa until 2022: construction of a container terminal at the quarantine mole, the construction of pier No. 35, construction of the highway “North-South”, reconstruction of the production area for the manufacture of medicinal preparations by the company “Interchem”.

In implementing this strategy, with the aim of improving the investment climate have been adoption of the general plan of Odessa, of the zoning plan of the city and detailed plans of urban areas; improvement of the current system of monitoring and supporting investment projects.

Set out in this paper is a refined method of calculation of concession payments accepted by the Ministry of Economic Development and Trade of Ukraine.

## RESEARCH CONCLUSION AND CONTEMPLATIONS

The following conclusions were reached as a result of the conducted analysis of “Calculation method of concession fees”, approved by the Cabinet of Ministers of Ukraine.

1. In accordance with the requirements of international methodologies of estimation of effectiveness of projects, it is necessary to take the inflation factor into account through specification of interest rate of return.
2. Estimating the investment attractiveness of the concession agreement, it is necessary to use method of consolidated value. Concession projects may look attractive for two reasons: (a) project participants can make some mistakes; (b) if participants will use competitive advantage, ie economic rent, they can expect to receive superprofit from the project.
3. The cost of the capital assets should be determined not as a mean value for the year, but as an average annual cost taking inflation into account.

The practical value of the proposed approach underlies in that fact that we obtain a more correct value of concession fees with its use, as take into considering the factor of inflation in contrast to the method of calculation proposed by the government. The current legislation should create competition in the market using concession competition based on reasonable methods of calculating correctly concession payment.

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