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Appraisal of Comprehensive Investment Projects Financed from the EU Funds in the Czech Republic with using Cost Benefit Analysis Principles

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Summary:

This paper is focused on the Cost Benefit Analysis (CBA) principles and applications of projects in the EU and Czech Republic which are financed from the European Union funds. The Evaluation Unit, DG Regional Policy of the European Commission has elaborated a set of rules, which each country should keep while distributing subsidies. The very important tool, which is used for comprehensive projects, is the Cost Benefit Analysis. The right application of the CBA principles should ensure that EU subsidies are used in order to maximize social welfare. The aim of this paper is to compare the general CBA methodology of the EU with some methodologies used outside of the EU and critical focus on application of CBA principles in the Czech Republic.

Keywords: Cost Benefit Analysis, European Union, European Union funds, investment project, feasibility study.

Zhodnocení komplexních investičních projektů financovaných z fondů EU v České republice při použití principů analýzy nákladů a výnosů

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Abstrakt:

Článek se soustředí na aplikace a principy analýzy nákladů a výnosů (CBA) při podpoře projektů v EU a České republice financovaných z fondů Evropské unie. Evaluační tým generálního ředitelství pro regionální politiky Evropské komise vypracoval soubor pravidel, která by měla být dodržována každou zemí při rozdělování dotací. Velmi důležitým nástrojem, který se používá pro komplexní projekty, je analýza nákladů a výnosů. Správná aplikace principů CBA by měla zjistit, že dotace EU jsou využívány s cílem maximalizovat společenský blahobyt. Cílem tohoto příspěvku je porovnat všeobecnou metodologii CBA v Evropské unii s jinými metodologiemi používanými mimo EU a kriticky se zaměřit na aplikaci principů CBA v České republice.

Klíčová slova: analýza výnosů a nákladů, Evropská Unie, fondy Evropské Unie, investiční projekty, analýza proveditelnosti.

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Introduction

The Czech Republic became a member of the European Union in 2004 together with other nine countries. This accession brought both advantages and disadvantages to Czech citizens. Since the accession, the Czech Republic has been also influenced by regional policy of the EU, which is one of the most evident ones, because the policy has brought billions of Euros for development projects. According to the EU rules, each project must be evaluated before the approval and in addition, comprehensive projects with a larger budget must also be assessed from the social welfare point of view. A tool which helps to evaluate this kind of projects is the Cost Benefit Analysis (CBA). The article aims some theoretical and practical issues related to the CBA from international, EU's and Czech points of view and offers some critical observations related to the practical application of the CBA.

1. European Regional Policy

The European Union has many policies. One of them is regional policy focused on economic and social development of the member countries. Financial instruments which should help to implement the policy are called European Union Funds.

1.1 Introduction to European Union Funds

The European regional policy is planned for seven year programming period. During the current period 2007–2013 the EU is focused on three main objectives, which are 1) convergence, 2) regional competitiveness and employment and 3) European territorial cooperation. Those objectives are financed from special instruments – three funds, which are European Regional Development Fund, European Social Fund and Cohesion Fund. First and second fund are comprehensively called structural funds (European Commission 2009: 4).

Total budget for current period is circa 347.4 billion EUR (European Commission 2008: 4). This huge amount of money should be invested in many public, semi-public and private projects, which should improve social and economic situation in the European Union. The sum of money is allocated by the European Commission, national and regional governments and municipalities through operation programs. In order to achieve as great impact as possible, each perspective project should be evaluated. Then only those projects, which contribute to the aims mostly, should be financed or co-financed from the funds.

1.2 General Ways of Project Evaluation

There are many methods which are used for project evaluation across the whole union. They are modified by local authorities and specified for their particular purposes. On the other hand, they should be based on common methodology which is issued by the European Commission – Directorate General Regional Policy (DG Regio).

Projects are generally divided into two groups – investment and non investment ones. Non investment projects are usually focused on improvement of human capital and they are assessed by experts who distribute points to them. Experts should assess projects according to the predefined criterions. The core of the assessment is a comparison of project compliance with pre-defined aims of a related operational program and costs adequacy. Generally, evaluation of non-investment projects depends more on experts' opinions than on hard financial features and measureable indicators.

The second group of projects, which are the investment ones, is evaluated on a different base. The appraisal is generally focused on hard data because the projects have tangible or intangible outputs, which are measureable and their impact is more predictable. The projects are mostly appraised by using a feasibility study, which should be elaborated during a pre-investment period. The required content of a feasibility study depends both on a type and size of a project and rules of a local governing body. It means that there are small investment projects, where feasibility study is not necessary or it is elaborated in a simplified form. Next, there are projects, where a feasibility study is compulsory. This kind of projects is prevailing. Moreover, there exists a group of comprehensive projects, which requires processing of a Cost Benefit Analysis (the CBA). This type of analysis usually contains both feasibility study and assessment of the project from the social point of view. The next table shows examples of Czech operational programs and limits for the feasibility study and the CBA.

Table 1: Examples of limits for the feasibility study and CBA.

Operational program	No feasibility study / simplified form	Feasibility study	Cost Benefit Analysis
NUTS 2 Northwest Regional Operational Program	< 5 million CZK / 0.2 million EUR ¹	5–90 million CZK / 0.2–3.6 million EUR	> 90 million CZK / 3.6 million EUR
Operational Program Environment	-	< 25 / 50 million EUR ²	≥ 25 / 50 million EUR
Operational Program Prague Competitiveness	-	< 0 ³ , 10, 20 million CZK ⁴ / 0, 0.4, 0.8 million EUR	> 0, 10, 20 million CZK / 0, 0.4, 0.8 million EUR

Source: NUTS 2 Northwest Regional Operational Program (2010: 4), Operational Program Environment (2011: 21) and Operational Program Prague Competitiveness (2011: 50).

2. Cost-Benefit Analysis

The Cost Benefit Analysis is generally used for evaluation of projects which are financed from public sources, but it can be rarely used for private or semi-private projects as well.

2.1 Basic Principles

The main aim of the CBA is to examine whether the projects will bring more social benefits or social costs. The analysis also helps to decide if we need to make an order of projects according to their social profitability or maximization of social welfare. This is also a reason why some experts⁵ say that keeping the rules of the CBA can substitute a political mechanism. It is better to elaborate the CBA for a project than hold an election when a public decision is necessary.

The crucial issue related to the analysis is transformation of social costs and benefits into cash flows and proper discounting of these cash flows. Each public project should be aimed at maximization of differences between present value of benefits and costs. Then, only projects with positive social net present value should be launched and completed. Theoretical concept is based on Welfare economics principles. The aim of the CBA is to deal with these questions (Brent 2008: 4):

- Which costs and which benefits are to be included?
- How are the costs and the benefits to be evaluated?
- At what interest rate are future benefits and costs to be discounted to obtain the present value of the project?

¹ Illustrative exchange rate - 25 CZK/EUR.

² The limit was changed from 25 to 50 million EUR during the implementation.

³ For environmental friendly transportation projects only.

⁴ It depends on a type of project.

⁵ For example Allan Williams. Department of Economics. University of York.

- What are the relevant constraints?

The theoretical concept of the CBA is relatively worldwide stable and there are not big differences among expert opinions⁶. Contrary to that, real application of the basic CBA principles and methodological approach differ according to the country, purpose, depth of knowledge etc.

Although the CBA is primarily a tool of public investment decision making, it can be a tool for project management as well. From a broader perspective, the CBA either can be a complement to a feasibility study, or a feasibility study can be a part of the CBA.

2.2 Comparison of Applications and Methodological Approaches

First Economist who described basic principles of the analysis was Jules Dupuit from France. His works were formalized by British economist Alfred Marshall (Maneschi 1996: 411–412). Practical application of the Cost Benefit Analysis has its origins in the United States and the United Kingdom. First project, which was evaluated by the CBA, was waterway infrastructure in the U.S. Later, the selected CBA techniques were used for big infrastructure projects as highways, railways and underground lines.

Experience in the United States and United Kingdom

In 1978, Executive Order 12044 was adopted in the U.S. It states that benefits and costs for new government regulation must be quantified. It was the first systematic attempt, which should have guaranteed, that the CBA principles were used for assessments of new government regulations. Subsequently, Executive Order 12291, issued in 1981, states that new government regulation must pass the CBA test. It means that benefits for society must outweigh the potential costs. This order also describes general rules, which should be used during an evaluation (Peterw, Wooley).

Practical application for investment project in the U.S. is connected with big infrastructure and transportation projects. Earlier, the CBA was prepared for each project separately and methodology, input data, coefficients etc. differed for each project. It means that there could be different conclusions for very similar projects. This was a weakness of the CBA application. Information technologies meant a big improvement, because software tools, which should help with the CBA preparation, could be developed. For example there were

⁶ For example Ezra J. Mishan, London School of Economics, Arnold C. Harberger, UCLA, Stephen A. Marglin, Department of Economics at Harvard University or Robert J. Brent, Fordham University.

developed many software tools⁷ with government support, which are used for cost and benefit quantification and consequently for public project investment decision making.

A similar approach was chosen in United Kingdom where the government introduced New Approach to Appraisal (NATA) in 1998. This approach combines the CBA approach and environmental approach, and it is used for transportation project primarily. In the beginning, it was more methodology, but since 2007 it has been modified and transformed into a software tool. This tool has some advantages which allow processing more reliable analysis. The biggest advantage is its suitability for projects, where costs and benefits are not clear. It also does not take time savings as prevailing benefits, but it is focused on other aspects as well (Le Blond 2008: 12–13).

European Commissions and Cost Benefit Analysis

Although the CBA can also be used for non investment projects, DG Regio uses this approach primarily for investment projects. European Commission prepared a methodology Guide to Cost Benefit Analysis for Investment Projects, which is the primary source of methodology for all funded projects where the CBA is necessary. First brief methodology was issued in 1997 and had been continuously improved till 2008. The methodology is obligatory for projects financed from European funds, where budget is higher than 5–50 million EUR depending on a type of project and funding source (Florio 2008).

The methodology contains detailed instructions for experts who evaluate a project. The first step is definition of objectives, which the assessed project aims. Special emphasis is placed on social impacts identification. It helps to evaluate rationality of the project. Secondly, there is methodology for project definition and logical framework. Especially, proper project definition is crucial for right preparation of the CBA. The next step is focused on the feasibility study, because there is an assumption that it makes sense to assess a technically, socially, physically and institutionally feasible project only. This part also deals with possible alternatives.

If a project is properly defined and feasible, the further process is focused on financial and social aspects of the project. At first, there is a financial analysis, which assesses financial impacts. Then, there is an essential evaluation of the project from social point of view, which contains five important steps:

- Market prices and tariffs are converted to shadow prices, which are more suitable for a social impact assessment.
- Project externalities are described and converted into cash flows.

⁷ For example: Cal-B/C, MicroBENCOST, STEAM, HERS-ST, StratBENCOST, etc. Source: California Department of Transportation < www.dot.ca.gov >.

- Relevant indirect effects are added to analysis.
- Cash flows of the project (converted social costs and benefits) are discounted with using social discount rate.
- Finally, economic indicators as economical net present value, economical rate of return or benefit-cost ratio are figured out.

When the projected is assessed and passes the CBA valuation, then risk analysis is the last step, which is important for the project approval.

The whole process of assessment is relatively time and resource consuming, but on the other hand, it allows passing the only projects, which bring more benefits than costs for society and help improve social welfare. The European commission pressures on governments of particular countries to use the CBA approach not only for projects financed from European sources, but for other large public or semi-public projects as well.

Rightness of Using Cost-Benefit Analysis by Czech Authorities

The Czech government and local governments are obligated to require elaboration of the CBA for projects both financed from European Union funds and with budget over 5–50 million EUR based on a type of a project. As it is displayed in the Table 1, some authorities require the CBA for projects with lower budget too. The methodology of CBA should be derived from methodology described in the Guide to Cost Benefit Analysis for Investment Projects mentioned above. The application of the methodology is not very clear, which is demonstrated on the four examples of operational programs. They are programs which use exactly the notion “CBA” in their materials. Other programs deal with some CBA principles only and do not use the CBA methodology primarily.

- NUTS 2 Northwest Regional Operational Program
- Operational Program Environment
- Operational Program Prague Competitiveness
- NUTS 2 Moravia Silesia Regional Operational Program

NUTS 2 Northwest Regional Operational Program requires the CBA for projects with budget over 90 million CZK. The methodology is very poor and contains only outline of the CBA without either detailed specification or link to other methodological sources.

Operational Program Environment uses the CBA for complex projects with budget over 50 million EUR. The CBA is tied with feasibility study. It has developed a simple methodology and a spread sheet model. The methodology refers to the methodology of the European Commission only. The spreadsheet model is simplified, but it keeps essence of the methodology precisely (fiscal

aspects, externalities and shadow prices). On the other hand, it allows using only limited number of externalities and conversions to shadow prices. Then, discounted transformed flows are added to financial cash flows of the project. Final output from the both feasibility analysis and CBA is displayed on a separated sheet.

Operational Program Prague Competitiveness uses the CBA for majority of projects. There is a guideline where the methodology is described. The methodology is based on the official methodology of the European Commission. The first visible problem of the methodology is suggestion to use market prices as shadow prices for quantification of cash flows. This is not good advice because market prices are often different than shadow prices. The simple reason is that majority of market prices are influenced by taxes, subsidies and other government regulations. It implies that each market price cannot be a shadow price simultaneously (Brent 2008, 121). The methodology also does not take into account possible software tools and present the CBA as a text document – similar to the feasibility study.

NUTS 2 Moravia Silesia Regional Operational Program does not explicitly specify a limit for the CBA preparation. On the other hand, there is issued manual for preparation of feasibility study where the CBA is included. The manual is more a practical illustration of web form completing than an exact methodology. The CBA is elaborated with using a web software tool. The part called CBA is intended to capture the priceless impacts of the assessed project. The application offers variability of costs and benefits, which can be caused. The author ads only required factors and their quantification, not shadow prices.

2.3 Main Practical Problems

The CBA is very useful tool, but still there are some problems related to evaluation of projects. According to the own comparison of methodologies (not empirical research), it can be difficult to achieve the next characteristics simultaneously:

- Methodological rightness of the elaborated CBA.
- Mutual comparability and consistence of results.
- Low resource consuming preparation.

We can prepare CBAs where the theoretical methodology is used very preciously and results of CBAs are mutually comparable. On the other hand, this detailed elaboration of CBAs requires a lot of time and other necessary resources. The reason is that a lot of theoretical economic models have to be prepared in order to obtain real shadow prices, figure out social discount rate or define all externalities of assessed projects.

We can also prepare CBAs where the theoretical methodology is used very precisely and a little of resources are consumed. Contrary to that, these CBAs are not mutually comparable, because a little of resources do not allow to figure out all variables and to inspect all inputs, which are necessary.

We can also prepare CBAs where results of CBAs are mutually comparable and a little bit of resources is consumed. But then it is not possible to achieve the methodological rightness of the elaborated CBAs, because there must be used some simplifications.

Then, we can also find other problems related to the CBA. At first, there are two points of view on the CBA. One point is more theoretical, which requires proper methodology and scientific approach. Second point is more practical, because practical applications of the CBA require some simplifications and the systematic approach.

Secondly, the CBA takes into account some possible impacts of assessed project, which are very hardly statistically verifiable. And if they are verifiable then they are not universal for variety of practical applications.

Thirdly, because of technical approach, many inputs are generalized. For example, the European Commission defined variety of coefficients (accounting ratios), which are used for conversion of market prices to shadow prices. Then, social discount rate is advised for all projects across the European Union and does not reflect local preferences. It is also very difficult to identify the relevant market, especially in the European Union or United States, where borders among the states are not very determined.

Fourth problem, which is especially visible in the Czech Republic, is hypocritical application of the CBA principles for evaluation of projects financed from EU. The methodology is not clear and the process of the CBA preparation allows modifying variables and inputs in order to obtain desired predesigned results. A weakness is also the fact, that the CBA is used in the Czech Republic especially for projects financed from the European Union funds, but not systematically for other public or semi-public projects.

Finally, there are also many advantages of the CBA approach. The most important advantage is the fact, that politicians and governments use these principles at least for some projects. This fact forces them to think about projects more rationally and take social utility into account too.

Conclusion

The CBA principles are very important for public investment decision making. They help to figure out costs and benefits of a project. Currently, the CBA is especially used for big projects financed from the European Union funds. Despite the fact, that practical applications of the CBA principles are not consistent, the CBA helps at least to a little reflection of the assessed project. Basically it can answer the question whether the project brings more cost or benefits, but on the other hand, precise calculation of costs and benefits highly depends on a used methodology and accuracy of input variables.

The CBA using in the Czech Republic depends on a way how a project is prepared. If there is a project evaluation at first and consequently political decision is made, it is good starting point for using the CBA as a toll for project evaluation. In this case, there should be used methodology (or its principles) which is validated in the U.S. or Great Britain primarily. On the other hand, if a political decision is made and the CBA is only elaborated in order to advocate a project, it does not make sense to use it because it is denial of its purpose.

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