

## **SPECIFICITIES OF USING THE COST-BENEFIT ANALYSIS FOR PUBLIC PROJECTS FINANCED BY THE STRUCTURAL FUNDS**

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### **1. Introduction**

The Cost-Benefit Analysis represents a tool of great utility in taking the decisions of allocating resources for investments financed for the public funds. In Romania, the usefulness and applicability of Cost Benefit-Analysis is obvious regarding the elaboration of project documentation in order to access financing that is available within different operational programs, especially those that involve investments in infrastructure.

The Cost-Benefit Analysis can help public decision-makers to identify projects that will maximize net social benefits and thus to establish the ranking of various infrastructure projects.

Cost Benefit-Analysis (CBA) represents a quantitative method for estimating the desirability of a project or a government policy based on calculating the ratio of future costs and benefits. J. Dupuit, a French engineer and A. Marshall, British economist had defined some of the concepts which subsequently became the cost-benefit analysis.

Through public investment projects, the government does not pursue profit maximization, as the private sector does, but the maximization of social welfare, which is manifested through the provision of national defense, law and order, education, building road infrastructure etc. On the other hand, this should not mean that public investment projects are not subject of an efficiency assessment.

The Cost-Benefit Analysis allows decision makers to do what is usually done by a perfect market, namely the allocation of resources for a project, as long as the marginal social benefit exceeds the marginal social cost.

Cost-Benefit Analysis estimates and compares the monetary equivalent of social costs and benefits in present and future, from the point of view of citizens, related to public investment projects in order to decide whether they are in the public interest.

The CBA can be used whenever it is necessary to take a decision and it's not limited to a particular academic discipline, or a particular sector, requiring knowledge of management, finance and social sciences.

By analysing the basic issues that concern both the financial and the socio-economic analysis, we can say that the primary purpose of this type of analysis is highlighted in a predictable way as social welfare created by the project that will be analyzed. Essentially it consists of comparing total costs with benefits expressed in monetary terms.

### **2. Reference framework for applying the CBA**

Council Regulation (EC) No. 1083/2006 of July 11 2006 laying down general provisions on the European Social Fund and the Cohesion Fund and repealing Regulation, Article 40 states that the managing authorities are required to provide a CBA for major projects to be financed under their

operational programmes for the cohesion policy :

*„Article 40. - Member States and Commission Management Authority will provide the following information on major projects:[...]*

*(e) a cost benefit-analysis includes a risk analysis, as well as the foreseeable impact on the concerned sector and on the socio-economic situation of the member state and/or of the region and, if possible, as appropriate, to other regions from the Community”.*

For the programming period 2007-2013, the European Commission presented a set of working rules that promote consistency in carrying out CBA<sup>1</sup>. General methodologic framework of the CBA in the context of structural instruments is provided by the cost benefit-analysis guide of investment projects, handbook published by the European Commission in 2002, revised and reissued in 2008.

Given the legislation, the Government Decision no. 28 of January 9 2008 requires the cost benefit-analysis as the part of economical and technical documentation related to public investments.

Cost Benefit-Analysis is an analytical instrument for ensuring rational allocation of resources, used to estimate (from the point of view of the benefits and costs) the socio-economic impact due to the implementation of certain actions and/or projects. Impact must be assessed against predetermined targets, the analysis is typically accomplished by taking into account all individuals affected by the action, directly or indirectly.

This method of evaluation of expenditure programs is not a direct procedure for decision making, but one which leads to a better decision orientation.

Although this decision is specific to the private sector, it was afterwards

taken for the program based budgeting and the public sector analysis. The Cost Benefit-Analysis purpose for public spending programs is to determine whether a given level of public spending can produce a greater benefit than if it were used in an alternative public program or if it had been kept unused. Thus, cost benefit-analysis in public sector consists of a set of techniques designed to ensure that limited resources are efficiently allocated between private and public sector, and subsequently between alternative projects within each sector.

Using cost-benefit analysis in the public sector is fervently supported by many academics, but among some of those operating in the public sector are showing an attitude of rejecting it. This derives often from the fact that although cost-benefit analysis is used to good effect in business for profit, when used in comparisons of public spending programs, the method becomes very complex, because of the difficulty of measuring future costs and benefits.

In general, the CBA needs to decide whether the analysis is done by adopting a local, regional, national, EU or global perspective. The appropriate level of analysis must be determined in relation to the size and scope of the project as well as in relation to the group/area where the project has a relevant impact.

The objective of the cost-benefit analysis is to identify and quantify (to monetize) all the potential project impacts in order to determine appropriate costs and benefits. In principle, all impacts should be assessed be they financial, economic, social, environmental etc. Traditionally, the costs and benefits are evaluated by analyzing the difference between the scenario "with project" scenario and the one "without project" (the so-called "incremental approach"). Further, the results are aggregated to identify net benefits and whether the project is timely and deserves to be

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<sup>1</sup> Working Document No. 4: *Guidance on the methodology for carrying out cost-benefit analysis.*

implemented. Thus, CBA can be used as a decision tool for evaluating the usefulness of investments to be financed from public resources.

Mainly in the context of training and assessment of CF and ERDF funded projects European Commission calls for cost-benefit analysis for the following reasons:

➤ to determine whether the project deserves to be financed - the goal is to answer the following questions: Does the project contribute to the objectives of the EU regional policy? Does it encourage growth and stimulates employment? Thus, if the project's net benefits to society (benefits minus costs) are positive, the project should receive assistance from Community funds and be financed. Otherwise, the project will be rejected. This decision is taken using the economic analysis as part of the cost-benefit analysis;

➤ *to determine if the project needs financing - the project can be financially profitable and in such cases it will not be subject to structural funds co-financing.* When developing and sending a project to be financed from the ERDF or the CF, cost-benefit analysis is required for major projects only. Major projects are defined as indivisible operations, whose total costs exceed the following values:

- 25 million euro for projects in the environmental sector;
- 50 million euro for projects from other sectors.

For projects that do not exceed the values listed above, according to Government Decision no. 28/2008, economic analysis is not required. Nevertheless, even for the projects below these thresholds, the relevant management authority could decide that the economic analysis is needed in the selection of projects.

For evaluating and comparing future costs and benefits generated by a project, actuarial calculations are needed.

### 3. Specificities of applying the CBA to public investment projects

The use of the cost-benefit analysis in the public sector has some features that arise due to the differences between the objectives to be pursued by the two sectors of the economy.

The main differences involved by the cost-benefit analysis of specific public sector objectives are reflected in the following:

- ↳ inclusion of different costs and benefits in the net present value analysis (private costs and private benefits, costs and social benefits in the public sector);
- ↳ use of different principles for assessing the costs and benefits in the public sector compared to those used in private sector (market prices in the private sector, so-called shadow prices in the public sector);
- ↳ applying different discount rates.

### 4. Identifying and defining investment objectives

The objectives taken into consideration must include social and economic components connected with the project, not only physical characteristics and there should be indications of how to measure their level of achievement as well as indicating statistical sources used.

In case of investment involving commitments of potential users, they must know the expected tariffs for the use of various types of public infrastructure and these must be included in the cost-benefit analysis.

Each operational program includes general objectives and expected targets at priority axis level as well as at the level of the key areas of intervention.

Thus, after having identified an action or a problem to be solved, the objectives and the consequent plan of action will be defined in a consistent manner with the overall objectives and priority axes of the relevant operational programs, including assessing whether the proposed projects will help achieve

the expected results of the operational program.

### 5. Financial analysis

The purpose of the financial analysis is to use the project cash flow projections to calculate rates of return, namely the internal financial rate of return (RIRF), the rate of return on investment (RIRF/C) and the rate of return on capital (RIRF/K), as well as financial net present value (VANF).

This analysis provides information on the inputs and outputs, their prices and the structure of income and expenditure over the forecast period.

It is developed, usually from the viewpoint of the owner (or statutory manager) of the infrastructure. There are cases where the owner and operator of the infrastructure are not the same entity (delegated management). In these cases the consolidated financial analysis will be used (as if the two made up a single entity).

The method used to develop the financial analysis is the "discounted net cash flow". In this method, non-monetary flows such as depreciation and provisions are not taken into account. Unforeseen expenditure will be considered only if they are included in the eligible project costs. They will not be counted in determining the size of the grant as long as they do not represent actual expenditure, but rather risk mitigation measures.

More specifically, the financial analysis must take the following steps:

- ✓ estimating revenues and project costs and their implications in terms of cash flow. Projects generate their own income from sales of goods and services, eg. charges for water supply, public works fee for access to the motorway. This revenue will be determined by forecasting the quantities of products/services provided and the price/other charges (based on the demand analysis). In general, transfers or subsidies, VAT or other taxes levied

by the consumer are not included in determining future income.

Operating costs include all payments made for the procurement of goods, services and works which are not part of an investment and are covered on an yearly basis. These costs may include: direct costs of production (consumption of materials and services, personnel, maintenance, production overheads), general and administrative expenses, selling and distribution expenses. The calculation of operating costs will exclude all items that do not generate a monetary actual cost, even if they are items normally included in the book keeping (eg. depreciation);

- ✓ *determining the overall cost of the selected option as well as the eligible expenses that can be financed from the structural funds;*

- ✓ definition of the project financing and financial profitability. This goal is achieved by considering the level of funding that can be obtained from CF / ERDF, and any other sources (national sources, bond, loan);

*-cash flow forecast verification to assess the capability to ensure proper functioning of the project investment and debt service obligations. A project is considered sustainable in financial terms when there is no risk of running out of cash in the future. An important element is planning incoming and outgoing cash. The analysis must demonstrate the ability to cover payments each year by funding sources (including income and any cash transfers) for the whole reference period of the project. Sustainability occurs when the cumulative net cash flow is positive for all the years of analysis.*

The tables below show the main elements to be considered in the calculation of the financial flows for two broad categories of public investment projects:

- Cost-benefit analysis prepared for transport projects (building, rehabilitation and upgrading of roads, highways etc.):

Table no. 1			
<b>FINANCIAL ANALYSIS IN THE TRANSPORT SECTOR</b>			
<i>- summary -</i>			
<b>Elements/indicators</b>	<b>FNPV(C)</b>	<b>Sustainability</b>	<b>FNPV(K)</b>
<b>TOTAL INVESTMENT COST</b>			
❖ Land	-	-	
❖ Buildings	-	-	
❖ Equipment	-	-	
❖ Intangible assets (licences, patents)	-	-	
❖ Other pre-production expenses	-	-	
❖ Changes in working capital	- (+)	- (+)	
<b>RESIDUAL VALUE</b>	<b>+</b>		<b>+</b>
<b>TOTAL OPERATING COSTS</b>			
❖ Work expenditure warping cracks and crevices	-	-	-
❖ Work expenditures with removal local irregularities and paths	-	-	-
❖ Signance maintenance	-	-	-
❖ Administrative costs	-	-	-
❖ Periodic maintenance – bituminous layer implementation works*	-	-	-
❖ Other outflows			
❖ Interest		-	-
❖ Loans reimbursement		-	-
❖ Taxes		-	
<b>TOTAL OPERATING REVENUES</b>			
❖ Access fees	+	+	+
❖ Non-profit projects (the most common situation in this area)			
<b>SOURCES OF FINANCING</b>			
❖ EU assistance		+	
❖ National public contribution		+	-**
❖ Local public contribution		+	-
❖ Loans		+	
❖ Other resources		+	

\* Not included in the investment costs;

\*\* Only regarding the performance indicators concerning the national public capital.

- cost-benefit analysis developed in the social sector (building, rehabilitation and upgrading of hospitals, homes, schools, town halls, museums, parks etc.):

Table no. 2			
<b>FINANCIAL ANALYSIS IN THE SOCIAL SECTOR</b>			
<i>- summary -</i>			
<b>Elements/indicators</b>	<b>FNPV(C)</b>	<b>Sustainability</b>	<b>FNPV(K)</b>
<b>TOTAL INVESTMENT COST</b>			
❖ Land	-	-	
❖ Buildings	-	-	
❖ Equipment	-	-	
❖ Intangible assets (licences, patents)	-	-	
❖ Other pre-production expenses	-	-	
❖ Changes in working capital	- (+)	- (+)	
<b>RESIDUAL VALUE</b>	<b>+</b>		<b>+</b>

<b>TOTAL OPERATING COSTS</b>			
❖ Specific consumables	-	-	-
❖ Labour	-	-	-
❖ Electricity	-	-	-
❖ Heat			
❖ Water and sewerage			
❖ Post and telecommunications			
❖ Salubrity			
❖ Maintenance			
❖ Administrative costs	-	-	-
❖ Periodical maintenance; replacements	-	-	-
❖ Other outflows			
❖ Interest		-	-
❖ Loans reimbursement		-	-
❖ Taxes		-	
<b>TOTAL OPERATING REVENUES</b>			
❖ Tax on services rendered/supplied	+	+	+
❖ Non-profit projects (considering that social sector concerns public institutions which are financed from the state budget)			
<b>SOURCES OF FINANCING</b>			
❖ EU assistance		+	
❖ National public contribution		+	-
❖ Local public contribution		+	-
❖ Loans		+	
❖ Other resources		+	

## 6. Socio-economic analysis

Economic analysis measures the economic, social and environmental impact of the project and its basic objective is to demonstrate that the project has a net positive contribution to society and therefore deserves to be financed from EU funds. For a project to be selected, its benefits need to exceed the costs and, more specifically, the present value of the project's economic benefits should exceed the present value of the economic costs of the project.

We suggest using a social-economic discount rate of 5.5% as

proposed by the European Commission in the Working Paper no. 4.

The starting point in the economic analysis is the calculated cash flow from the financial analysis, after having applied different types of corrections. These corrections are reflected in the socio-economic flows:

- ◆ fiscal corrections;
- ◆ monetization of externalities;
- ◆ conversion of market prices into accounting prices.

We illustrate the two different sectors and types of specific socio-economic costs and benefits, as follows:

- cost-benefit analysis prepared for transport (building, rehabilitation and upgrading of roads, highways etc.):

Table no. 3	
<b>ECONOMIC ANALYSIS IN THE TRANSPORT SECTOR</b>	
<i>- summary -</i>	
Elements/indicators	ENPV
<b>TOTAL NEGATIVE EXTERNAL COSTS</b>	
❖ diverted traffic in the area during the works	-
❖ environmental impact	-
<b>TOTAL SOCIO-ECONOMIC BENEFITS (quantifiable and non-</b>	

<b>quantifiable monetisation)</b>	
❖ savings from reduced time travel – VTTS	+
❖ savings in vehicle operating costs – VOC	+
❖ savings from reduced costs with transport of goods	+
❖ reduction in the rate of traffic accidents by increasing the level of comfort and road safety	+
❖ saving in costs of environmental pollution	+
❖ savings from reduced fuel consumption	+
❖ increased effectiveness and efficiency of public services	+

- cost-benefit analysis developed in the social sector (for the construction, rehabilitation and modernization of hospitals, homes, schools, town halls, museums, parks etc.):

Table no. 4	
<b>ECONOMIC ANALYSIS IN THE SOCIAL SECTOR</b>	
<b>- summary -</b>	
<b>Elements/indicators</b>	<b>ENPV</b>
<b>TOTAL NEGATIVE EXTERNAL COSTS</b>	
❖ diverted access in the execution area during the works	-
❖ environmental impact	-
<b>TOTAL SOCIO-ECONOMIC BENEFITS (quantifiable and non-quantifiable monetisation)</b>	
❖ creating new jobs	+
❖ development of the business field in the area	+
❖ reduce the number of people subjected to the danger of disease (hospitals)	+
❖ reduce the phenomenon of early school leaving (schools)	+
❖ reduce stress level by engaging in recreational activities (parks)	+
❖ improve the standard and quality of living	+
❖ increasing the level of urban architectural esthetics	+

Cost-benefit analysis is a major step in carrying out a feasibility study, as it allows for expressing an opinion on the economic and social value of the project as well as for a ranking according to their potential to create or increase net social benefits.

Among the weaknesses of this type of analysis, we might mention that its applicability is quite limited in terms of

social policies, it requires a high level of practical experience and the capacity of risk event handling, especially for projects that produce particularly long-term intangible qualitative benefits.

Overall, one may conclude that the cost-benefit analysis is much more than a simple exercise in algebra, requiring the capacity to master various techniques to allow for estimates in the medium and long run.

## REFERENCES

Council of the European Union	<i>COUNCIL REGULATION (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999;</i>
European Commission	Working Document No. 4: Methodological guidelines for achieving cost - benefit analysis;

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