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Clarification Paper no. 2

Cost Benefit Analysis and other methods for evaluating projects financed by ERDF and CF

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Victor Platon / scientifique researcher principal I, National Institute for Economics

This document has an informative character.

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AAM Management Information Consulting Private Company Limited by Shares

AAM Management Information Consulting SRL

Leader A.T.E.C. SRL

Intrarom SA

Infogroup Consulting SA

CONTENT

1. INTRODUCTION

The Cost Benefit Analysis (CBA) is one of the most used methods for the evaluation of the investment projects.

The COUNCIL REGULATION (EC) No 1083/2006 requires to perform CBA for projects whose total cost exceeds EUR 50 million (hereinafter referred to as major projects) (Section 2. Major projects, Article 39 and Article 40). **The term CBA, according to EU requirements, encompasses both the financial and economic analysis of the project proposed for financing.** CBA is needed for evaluating if a project which supports the objectives of the EU regional development policy is to be desired from an economic point of view and if it needs co-financing in order to be feasible from financial point of view.

More specifically, within the framework of preparation and appraisal of CF and ERDF project, the European Commission requires a CBA to fulfill two major goals:

(1) ***To assess whether a project is worth co-financing***.

CBA us used for determining the measure in which the project contributes to the social, economic cohesion policy and especially to reaching the objectives of KAI/PA/OP through which the financing is made. The decision to approve/reject the financing is made based on the indicators resulted from the *Economic Analysis*.

(2) ***To assess whether a project needs co-financing and its level***.

Besides being desirable from an *economic* standpoint a project may also be financially profitable without EU assistance, in which case it would not be co-financed by the Funds. To check if a project *should* be co-financed and to determine the level of co-financing requires a *Financial Analysis*. This because the EU grant should not exceed the amount of money that makes the project break even, so that no over financing occurs. The financial analysis measures the net cost to public finance and provides a significant comparison with other similar projects.

The CBA is therefore needed to provide evidence that, while fitting within the framework of EU regional policy objectives, the project is both desirable from an economic point of view and needs the contribution of the Funds for it to be financially feasible, but at the same time avoiding over financing.

At the same time there are two other secondary goals of the CBA:

1. To determine the financial sustainability of the project and of the company/institution that will get the co-financing.

Verifying the project's financial sustainability implies a cumulative positive cash flow for each year of the projection. Temporary shortfalls can be covered by a revolving credit (embedded in the model's cash flow statement), provided that the assumptions behind this revolving credit are reasonable in regard to the local financial markets. Also, when the financing structure of the project includes a long-term loan to be paid with

revenues within the scope on the financial projections, a debt service coverage ratio[1] of at least 1.2 will be required for each year of the loan amortization period[2].

2. To determine the profitability of the project.

The project's profitability will be measured by FIRR/C and FIRR/K[3], which will be calculated before and after the EU co-financing. In both cases, the values before the EU co-financing are expected to be low or even negative, which justifies the need for co-financing by the EU funds. After the EU co-financing is granted, the values should be around the financial discount rate in the case of FIRR/C (by definition, since this is the discount rate used to calculate the financing gap, this is the discount rate used for the calculation of FNPV/C in case of the Financial Analysis; for the programming period 2007-2013, the discount rate recommended by the Commission is 5%). For own invested capital it is required that the return not to be bigger than the required return on equity for companies in the same sector; the return of own capital is calculated with the indicator FIRR/K and this should not show an excessive return to the project promoters at the expense of the EU taxpayer.

In the next table the CBA performance indicators are illustrated in relation with the set objectives and the way how they are used for major projects according to regulation in force.

The following table shows the performance indicators and the way these are used for major projects, as required by the legislation in force.

Table 1. Main objectives of the CBA and used indicators

Objectives	Used Instrument	Performance indicators for project acceptance/rejection for financing	Observations
Worth co-financing	Economic Analysis	EIRR >5.5% ENPV > 0; B/C>1	These indicators are the basis for approving/rejecting EU funding; the project must bring net benefits for the society
Level of co-financing	Financial Analysis; Funding Gap method (FG)	FIRR/C < 5% FNPV < 0	These indicators establish that only projects with very low profitability (could not be financed by a bank) will get the EU support; FG gives the amount of EU support
Financial Sustainability	Financial Analysis	cumulative positive cash flow for each year	The company/institution that carries out the project will not stop the

[1] Measured as EBITDA/Debt Service, with EBITDA being the earnings before interest, taxes, depreciation and amortization
[2] Or higher if required by the IFI co-financing the project, when applicable.
[3] See the Working Paper No 1 on the Performance Indicators

		of the projection	activity due to lack of funding
Excessive Return of the project avoided	Financial Analysis	FIRR/K < determined benchmark (See Annex 1)	Preventing excessive return to the project promoters at the expense of the EU taxpayer

As regards the non-major projects (with values less than 50 million Euro), EC recommends to the EU Member States to develop their own methodology on the evaluation and selection of projects.

The objective of this working paper is to estimate the utility of using CBA and/or other evaluation and selection methods of projects to be financed by ERDF and CF and to propose alternative methods.

This document analyzes and explores the practice of using CBA for non-major projects (smaller than 50 million €) coming from the following investment sectors:

1. Regional and local infrastructure;
2. Rehabilitation of unused polluted industrial sites and preparation for new activities
3. Improvement of social infrastructure with subtypes as:
    a. Rehabilitation, modernization and equipping of the health services' infrastructure
    b. Rehabilitation, modernization, development and equipping of social services infrastructure
    c. Improving the equipments of the operational units for public safety interventions in emergency situations
    d. Rehabilitation, modernization, development and equipping of pre–university, university education and continuous vocational training infrastructure
4. Strengthening the regional and local business environment with subtypes:
    a. Development of sustainable business support structures of regional and local importance
    b. Support the development of micro-enterprises
5. Sustainable development and promotion of tourism, with subtypes:
    a. Restoration and sustainable valorization of cultural heritage, setting up and modernization of related infrastructure
    b. Creation, development, modernization of the tourism infrastructure for sustainable valorization of natural resources and for increasing the quality of tourism services
    c. Promoting the tourism potential and setting-up the needed infrastructure in order to increase Romania's attractivity as tourism destination
6. Innovative and eco-efficient productive systems

7. Research, technological development and innovation for competitiveness
8. Information Technology for private and public sectors
9. Increasing energy efficiency and security of supply, in the context of combating climate change

Other methods which could be used for the evaluation of projects are also succinctly presented,

The working paper ends with a series of recommendations on how to use these methods.

2. WORKING PRINCIPLES

2.1 ROMANIAN PRACTICE IN APPROVING/FINANCING NON-MAJOR PROJECTS; CBA ROLE

2.1.1 MAIN APPROACHES USED IN EVALUATING NON-MAJOR PROJECTS

In analyzing the evaluation methods we may identify two approaches for the approval/rejection of projects of the type mentioned in the introduction (see next Table).

One approach is that used in the process of project selection for the Regional Operational Programme. Based on the Guide for applicants, the project performance indicators are used in the selection phase. Thus, indicators like FIIR/C, EIRR/C, FNPV and ENVP are used. Based on the values of the mentioned indicators a project either gets maximum of points (6) or minimum (0); there are not intermediary scores. If a project gets zero points is rejected (at least in theory).

In this way almost all projects get maximum points due to the fact that there is no clear methodology to estimate economic costs and benefits and there are no benchmarks for external effects of various projects. So, in order to get the maximum points, the applicant may take into account all sorts and hard to prove benefits and of the magnitude that will correspond to the criteria in the grid. In fact almost all projects get six points. There are very few projects that do not fulfill the CBA criteria and receive 0 points. These projects are not eliminated totally due to the fact that they already passed the eligibility/conformity criteria. So the practice is to send back the project for making the necessary correction and the projects is submitted again.

This approach makes the use of CBA performance indicators in the project selection phase irrelevant because by scoring only a minimum or a maximum a yes/no decision (for the majority of projects the performance indicators have values over the limits required by the Guide for applicants so they receive the maximum number of points) so there is no way to differentiate between projects by using CBA. In this context, the fact that the exaggerations of the applicant in benefit estimation further complicates the situation. It must be underlined that such an approach keeps under control the costs through relative detailed budgets but leaves for the applicant to decide over the number and value of the economic benefits.

The situation is complicated by the fact that CBA is demanded for all[4] infrastructure projects that are dealing with social infrastructure such as rehabilitations/modernizations of schools, hospitals, social centers, museums even churches for which the social benefits are very hard to estimate and some of them are small so CBA for these projects does not bring the pertinent information for justifying the approval or rejection of a project.

For these projects, from the socio-cultural field, the decision to finance considers other elements than the CBA indicators. In these circumstances, another evaluation method that brings relevant information for the evaluator should be found.

In case of projects on county roads, for this programming period only modernizations/rehabilitations were admitted. This type of projects does not justify the elaboration of CBA because, practically, the financial indicators cannot be calculated and the modernization/rehabilitation of these roads cannot bring economic

[4] Only the investments financed through KAI 4.3, the procurement of productive investments for micro-enterprises, does not follow this approach.

benefits big enough to justify the financing. For the majority of the projects, the beneficiaries exaggerated the economic benefits so as even the rehabilitation of a 2-4 km road to lead to adequate economic indicators (EIRR>5.5%). These works, although needed, do not have a measurable impact at the level of county economy or at the level of the region.

A second approach is the one applied for the selection of projects under the Operational programme Increase of Economic Competitiveness. Thus, in the evaluation grids a series of performance indicators have been included for which scores are given, but different from one Priority Axis to another or from one KAI to another. For instance some projects are approved if the next condition is fulfilled 0 < FIRR(C) < 13% (SOP IEC 2007-2013, Productive infrastructure and equipment purchase, PA 1, KAI 1.1 New businesses capacities and expanding of existing ones (see Table 2). The condition FIRR(C)<5% was introduced by the European Union in order to finance only projects that are not financed by banks due to low profitability but that are economically useful for society. The projects that have a financial ratability higher that 5% should get financial support from the banks. In the case mentioned the limit is extended from 5% to 13% without clear explanation of the 13% upper limit.

For research-development projects a decision was taken, which we consider adequate, not to use the CBA performance indicators (Operation 2.1.2 Research infrastructure, Operation 2.2.1. Procurement of the research equipment, Operation 3.1.1 Procurement of the IT hardware and software, broadband connection, Operation 3.1.4 IT solutions for schools and education institutions) (see Table 2).

In the case of Operation 4.1.1 Productive equipment for industry to reduce energy consumption, co-generation, energy conservation etc. the points are given in opposition[5] with instruction of the WD no. 4 which is recommended to applicants. Instead of penalizing profitable projects and supporting less profitable projects the methodology is doing the opposite.

In the case of Environmental protection by reducing energy losses and modernisation of the electric grid that is deteriorated, the approach is more complex and is more in line with WD no. 4.

[5] The following score is given for co-generation projects: 1. FIRR>12% - 7 points; 2. FIRR between 12% and 7% - 6-3 points; 3. FIRR<7% - 1 point.

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Table 1. Main indicators used in selecting/approving non-major projects financed through SI during 2007-2013 period

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
Road infrastructure	POR 2007-2013 AP 2 DMI 2.1	No	**20**	WD no.4 and a Short instruction	EIRR ≥ 5.5% B/C ratio ≥ 1	FIRR ≤ 5% şi FNPV < 0 **6 pct** FIRR > 5% **0 pct** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Rehabilitation of polluted sites and building new infrastructure	POR 2007-2013 AP 4 DMI 4.2	DA	**20**	WD no.4 and a Short instruction	EIRR ≥ 5.5% B/C ratio **≥** 1 Social rate 5,5% *Financial rate: 9%*	1. FIRR/c < 5% **(6 pct)** 2. FIRR/c between 5-9% **(3 pct)** 3. FIRR/c > 9% **(0 pct)** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Hospital infrastructure	POR 2007-2013 AP 3 DMI 3.1	NU	**15-20**	WD no.4 and a Short instruction	EIRR/C ≥ 5,5% şi ENPV/C ≥ 0	FIRR/C <5% and FNPV/C < 0, EIRR/C **≥** 5,5% and ENPV/C **≥** 0 **6 pct** FIRR/C **≥** 5% and FNPV/C **≥ 0 pct** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
Social infrastructure	POR 2007-2013 AP 3 DMI 3.2	NU	**20**	WD no.4 and a Short instruction	1. ENPV > 0; 2. EIRR. ≥ 5.5%; 3. B/C ratio>1	EIRR ≥ 5.5% and ENPV/C ≥ 0 **6 pct** EIRR/C < 5,5% and ENPV/C < 0 **0 pct** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Equipment for emergency situations	POR 2007-2013 AP 3 DMI 3.3	NU	No indications	No indications	No indications	No indications
Education infrastructure (Schools, universities, campuses etc.)	POR 2007-2013 AP 3 DMI 3.4	NU	**15-20**	WD no.4 and a Short instruction	FIRR/C <5% FNPV/C < 0	EIRR ≥ 5.5% and ENPV/C ≥ 0 **6 pct** EIRR/C < 5,5% şi ENPV/C < 0 **0 pct** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Infrastructure for businesses development	POR 2007-2013 AP 4	DA	**20**	WD no.4 and a Short instruction	1. ENPV > 0; 2. EIRR. ≥ 5.5%;	1. FIRR/c < 5% **(6 pct)** 2. FIRR/c between 5-9% **(3 pct)**

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
	DMI 4.1				3. Ratio B/C>1	3. FIRR/c > 9% **(0 pct)** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Achisitions of equipments for SMEs	POR 2007-2013 AP 4 DMI 4.3	DA	**No indications**	Simplified financial analysis	FIRR/c <= 9%, FNPV/c < 0 9% < FIRR/c <= 13%, FNPV/c ≥ 0	FIRR/c <= 9%, FNPV/c < 0 **6pct** 9% < FIRR/c <= 13%, FNPV/c ≥ 0 **3pct** FIRR/c > 13%, FNPV/c>0 **0pct** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Cultural Infrastructure	POR 2007-2013 AP 5 DMI 5.1	NU	**No indications**	WD no.4 and a Short instruction	EIRR ≥ 5.5% B/C ≥1 ENPV>0	FIRR/C <= 5 % and FNPV/C < 0 **6pct** FIRR/C > 5 % and FNPV/C ≥ 0 **3pct** **Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Tourism infrastructure	POR 2007-2013	DA	**10**	WD no.4 and a Short instruction	FNPV/C <0, FIRR/C < 5% (public)	EIRR ≥ 5.5% **6pct** EIRR < 5.5% **0pct**

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
	AP 5 DMI 5.2				FIRR/C>9% FIRR/C < 9% (public/privat)	**Max. point 6 pct, minim 3,5pct** If one project gets zero point it is eliminated.
Productive infrastructure and equipment purchase	POS CCE 2007-2013 AP 1 DMI 1.1 max. 1.075.000 lei for IMM	DA	**7**	WD no.4 and EU Manual on CBA	0 < FIRR(C) < 13% (Applicants Guide, pag.58)	0<FIRR/C< 5% **8pct** 5%=<FIRR/C< 13% **5pct** 0>=FIRR/C≥13% **0pct** **Maxim points 100, minim 50 pct** If one project gets zero point it is eliminated.
New businesses capacities and expanding of existing ones	POS CCE 2007-2013 AP 1 DMI 1.1 1075001-6450000 lei	DA	**10**	WD no.4 and EU Manual on CBA	0%<FIRR/C<13% (Applicants Guide, pag.63)	0<FIRR/C< 5% **8pct** 5%=<FIRR/C< 13% **5pct** 0>=FIRR/C≥13% **0pct** **Maxim points 100, minim 50 pct** **Projects that get minimum 60 pct get a regional**

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
	for IMM					**bonus (multiplier): 1,05 pct** for Regions Centru, NV, Vest, SE; **1,10 pct** for Regions NE, Sud Muntenia, SV.
Research infrastructure Operation 2.1.2	POS CCE 2007-2013 AP 2 DMI 2.1	DA	No indications	No indications	No indications	No indications
Procurement of equipment for research Operation 2.2.1	POS CCE 2007-2013 AP 2 DMI 2.1	DA	No indications	No indications	No indications	No indications
Equipment and IT software procurement, broadband connection etc. Operation 3.1.1	POS CCE 2007-2013 AP 3/DMI 3.1	DA	**7**	No indications	No indications	No indications
IT solutions for schools and other	POS CCE 2007-	DA	No	No indications	No indications	No indications

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
education establishments Operation 3.1.4	2013 AP 3 DMI 3.1		indications			
Productive equipment for industry to reduce energy consumption, co-generation, energy conservation etc. Operation 4.1.1	POS CCE 2007-2013 AP 4 DMI 4.1	DA	**15-20**	WD no.4 and EU Manual on CBA	No indications	**A.** FIRR for co-generation projects: **1.** FIRR > 12% -**7pct** **2.** FIRR between 12% and 7% -**6-3pct** **3.** FIRR < 7%; **1pct** **B.** FIRR for energy conservation: **1.** FIRR > 14% -**7pct** **2.** FIRR between 14% and 12% -**6pct** **3.** FIRR between 12% and 10%- **5pct** **4.** FIRR between 10% and 8% -**3pct** **5.** FIRR < 8 % - **1pct** **Maxim 100 points, minim 50 points**

Project Type	OP/PA	State aid (YES/NO)	CBA horizon (years)	CBA Instruction	Benchmarks for approving a project	Performance indicators in the evaluation grid (points)
1. Environmental protection by reducing energy losses 2. Modernisation of the electric grid that is deteriorated	POS CCE 2007-2013 AP 4 DMI 4.1	DA	**10-20**	WD no.4 and EU Manual on CBA	FNPV(C[6])≤0 FIRR(C)≤5% FIRR(K)=5÷8% ENPV(C)>0 EIRR(C)>25%	FNPV(C)≤0, FIRR(C)≤5% **10pct** FNPV(C)>0, FIRR(C)>5% **0pct** FIRR(K)=5÷8% **10pct** FIRR(K)=8÷10% **5pct** FIRR(K)<5% **5pct** FIRR(K)>10% **0pct** ENPV(C)>0, EIRR(C)>25% **10pct** ENPV(C)>0, EIRR(C)=15÷25% **6pct** ENPV(C)>0, EIRR(C)=5,5÷15% **3pct** ENPV(C)<0, EIRR(C) <5,5% **0pct**

[6] (C) refers to the calculation of the performance of the investment and (K) refers to the calculation of the performance of the capital invested by the operator

2.1.2 STAT AID PROJECTS AND THE ROLE OF CBA IN SELECTION PROCESS

From the Table 2 we may notice that a significant part of the projects are under State aide rule. That means a project can get co-financing - for instance 50%/50% - before any financial calculation is made. In fact the role of Financial Analyses to determine EU contribution is close to zero because the level of the co-financing is decided at the beginning. In this peculiar circumstance the question is: could CBA have a role in projects that get State Aide[7] (projects proposed by private organisations)?

From the perspective of determining the EU contribution the answer is not. The only possibility is to modulate the EU contribution (decrease from the state aid point of reference which is a maximum of co-fianncing) using FIRR (K). The logic will be next: a higher FIRR (K) for the project will mean lower state aide and lower FIRR (K) higher state aide. Of course, in case of values bigger than 14-15% the state aid could reach very low values or close to 0.

The Economic Analysis could be used for state aid projects in the eligibility phase not in the evaluation phase where the importance of CBA is lower than 10%. The role of economic analysis is to say if a project is benefic or not for the society and must be used in this way. In case of open calls with deadline for submission, the role of the economic analysis will be more significant because it can be used for the hierarchy of projects based on the contribution of the submitted projects to the welfare of the society (taking into consideration that the project must be big enough for measuring its impact[8]).

2.1.3 CONCLUSIONS REFERRING TO THE CURRENT PRACTICE IN ROMANIA AS REGARDS THE USE OF CBA FOR SELECTING NON-MAJOR PROJECTS

From what was said we may draw the next comments:

1. In spite of the clarity of EU documents there is a peculiar use of the performance indicators in evaluating projects; performance indicators are used in the Evaluation Grid either as a compliance/conformity tool (ROP) or to allocate points in a grid (OP-IEC). This approach diminish the role of the performance indicators that weight up to 10% or less in the final score or, even worse, it plays only a YES/NO role; the information regarding the rejection frequency of the projects because of performance indicators are not available, but, from our experience, we can state that the rejections on these justifications are few but they provoked disputes.
2. Financial analysis is not used in determining Financial Gap and FIRR/K indicator is not asked in the majority of the Guides for Applicants to see if the EU contribution is higher than necessary; financial analysis has the role to establish the sustainability of the project but there are few references to this;
3. Almost all non-major projects are financed under State Aid rules for which co-financing is established in advance of the financial evaluation. In this case, the use of the Financial Analysis is to employ FIRR/K as a tool to diminish the grant in such a way in which an applicant does not get more money than needed;

[7] The State Aid Schemes are approved through Government Decisions.
[8] See Working Paper No 1

4. Sustainability of the project/company is not observed in all cases; in any case sustainability criteria should be compliance/conformity criteria;
5. Economic analysis is used as a criteria to approve/reject a project but not in the eligibility phase; so a project that was considered eligible in the first phase could be rejected in the second phase when it suppose to get marks based on various criteria; in fact, when such a rare situation took place, the project was send to the applicant to "improve" the calculation and to be evaluated again;
6. There is no indication, methodology or models in how to estimate the external costs or benefits of a project; indicative values for external costs and benefits to be used by all applicants for funds under a KAI/PA/OP are missing. Such unit values are needed for CO2 emissions, NOx emissions, dust, particulate matters, injuries, sicknesses, loss of live, wage loss, building degradation, landscape deterioration/improvement, loss of biodiversity, soil erosion, carbon sequestration etc. So, the applicant may estimate its own values in order to get the level of the performance indicators that are asked in the Guide for Applicants. It may be noticed that there is not a standard value to be recommended to the applicants for a simple externality as a tone of CO2. This is why, in 99% of the cases, the Economic Analysis has economic indicators that are higher than the values requested in grids.
7. On the websites of DG Regio and DG Environment there are several papers and research reports that recommend min-max values for external costs and benefits of various interventions; none of these reports is used or recommended to the applicants in order to create a common background for drafting CBA reports.
8. Due to the fact that CBA economic indicators are not reliable, the decision to finance a project could be controversial (and it is, in some cases arriving to appeals in courts);
9. There is an extensive use of CBA for various investment types as churches, museums, schools, hospitals, social buildings etc. For such a project, which is under €50 million, it is almost impossible to determine the external costs and benefits; not having any list of externalities and unit costs/benefits associated each applicant estimates costs and benefits to get the requested indicators. In such cases there is no useful information from the performance indicators to be used in the final decision to finance or not;
10. Such extensive use of CBA represents a burden for the applicant that has to spend money for a CBA study that has little relevance; such a barrier of entry is not useful at all and inflict some losses for the applicants that are rejected for financing; in some priority axes, rejection rate is over 60% so all CBA drafted could be considered a loss for the applicant;
11. Result of the existing situation: weak basis for decisions to approve for financing/reject a project!
12. As a consequence the action to be taken is to develop standardised approach.

The main conclusion is next: for non major projects the use of CBA does not provide pertinent information to decide in good conditions if a project should be financed or not. For the applicant, drafting CBA does represent a barrier of entry and an unnecessary burden.

2.1.4 EXAMPLES FROM THE PRACTICE OF OTHER EU MEMBER STATES

Such a situation is not new. Older member states as the Netherlands faced significant difficulties in project appraisal in a period (1990) when CBA was not used as EU tool. Step by step, in 16 years, Dutch authorities coped to issue a Manual with Guidelines for major projects, a Guide for Smaller project and had created a Support Unit for managing and providing help in CBA applications (BOX 1).

It is important to be mentioned that in the Netherlands, Guidelines issues were subject to an independent evaluation and improvement were considered year by year. An important role was played by those who prepared the CBA and coped with the existing problems.

Box 1. Evolution of CBA practice in the Netherlands

- 1990's: difficulties with evaluation of large infrastructure projects
- 1998: Development of Guideline
- 2002: Evaluation of Guideline
- 2003: Action programme Guideline for implementation of improvements
- 2004: Additions to the Guideline
- 2005: 'OEI bij MIT' simplified guideline for smaller projects
- 2006: Unit Support Economic Evaluation (SEE)

A similar situation was met also in Germany, in case of drinking water-sewage projects. The evolution of CBA and other methods use is presented below[9]. Thus, in 1974, the capacity for CBA was evaluated and the National Guide was prepared and approved in 1978.

A re-evaluation of the evaluation procedures (1981) led to the conclusion that CBA does not bring relevant information which will support the decision to invest in a project or another and alternative methods were analysed. In 1982 a decision was taken to use the Dynamic Cost Comparison Calculation method, for which a first edition of a Guide was drafted. Since then, this Guide is updated with the support o the German Water Association, being in 2011 at the 8th edition. This Guide is used both by those who prepare the drinking water-sewage and the evaluators

[9] Presentation of prof. dr. eng. Reinhard F. Schmidke held at the International Conference on the Development and Maintenance of Water Infrastructure in Central and Eastern Europe using the EU financing, Budapest, 6 April 2011.

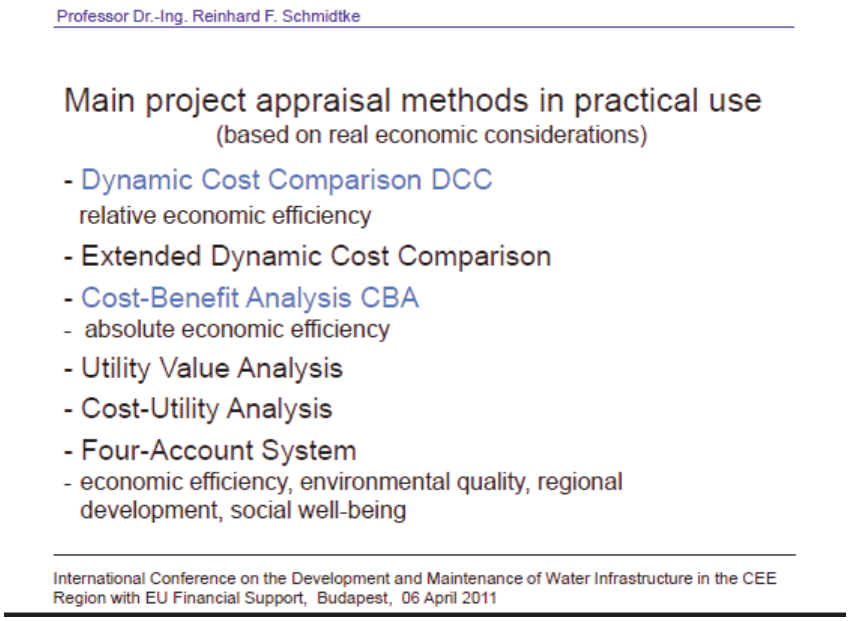
Professor Dr.-Ing. Reinhard F. Schmidtke

Development in Germany

Driving forth: German Working Group on Water Issues of the Federal States and the Federal Government (LAWA)

1974: Decision to improve project appraisal prodecures
1978: Guidelines for cost-benefit analyses
1981: Fundamentals of project appraisal procedures
1982: Decision to develop guidelines for dynamic cost comparison calculations (DCCC-Guidelines)
1986: 1st edition of the DCCC-Guidelines
2005: 7th edition of the DCCC-Guidelines
2011: 8th edition of the DCCC-Guidelines (forthcoming)

International Conference on the Development and Maintenance of Water Infrastructure in the CEE Region with EU Financial Support, Budapest, 06 April 2011



2.2 OTHER METHODS THAT COULD BE USED IN EVALUATING PROJECTS

Because the way of using CBA does not supply adequate information to make correct decisions in every situation, it is necessary to limit the applicability of this instrument. Other arguments may be brought such as the fact that CBA is very costly and constitutes a burden for the applicant, its quality is poor etc. That is why is important to consider alternative evaluation techniques. It is not useful to analyse all the alternative evaluation techniques so only those that can replace CBA are discussed here.

2.2.1 MULTICRITERIA ANALYSIS

Multicriteria analysis appeared in the 1960s as a decision-making tool. It is used to make a comparative assessment of alternative projects or heterogeneous measures. With this technique, several criteria can be taken into account simultaneously in a complex situation. The method is designed to help decision-makers to integrate the different options, reflecting the opinions of the actors concerned, into a prospective or retrospective framework. The results are usually directed at providing operational advice or recommendations for future activities/projects to be undertaken.

Multi-criteria evaluation should be organised with a view to producing a single synthetic conclusion at the end of the evaluation or, on the contrary, with a view to producing conclusions adapted to the preferences and priorities of several different partners. In the case of European Union socio-economic programmes, the different levels of partnership (European, national and regional) may be concerned. Each of these levels is legitimate in establishing its own priorities and expressing its own preferences between criteria.

Multi-criteria analysis is similar to the techniques adopted in the field of organisational development or information systems management. It also resembles cost-benefit analysis although it does not reduce the disparate phenomena to a common unitary (monetary) base.

A handbook on Multicriteria Analysis was also prepared under the same project as the present Working Paper ("Development of the capacity for the Cost-Benefit Analysis", project financed by ERDF through the Technical Assistance Operational Programme). For information on when and how to apply this method please consult this handbook.

2.2.2 COST EFFECTIVENESS ANALYSIS

Cost-effectiveness analysis (CEA) is a tool that can help to ensure efficient use of investment resources in sectors where benefits are difficult to value. There is a vast class of projects whose benefits either do not have a readily accessible market price or are not easily measurable in monetary terms. If the benefits of the project are measured in some nonmonetary unit, the NPV criterion for deciding whether we finance a project cannot be used.

CEA is a tool for the selection of alternative projects with the same objectives (quantified in physical terms). CEA can identify the alternative that, for a given output level, minimises the actual value of costs, or, alternatively, for a given cost, maximises the output level. For example, the evaluator can compare by simple output/cost ratios different projects that have the same aim.

CEA is used when measurement of benefits in monetary terms is difficult or very costly, or the information required is difficult to determine or in any other case when any attempt to make a precise monetary measurement of benefits would be tricky or open to considerable dispute. It does not consider subjective judgments and is not helpful in the case of projects with multiple objectives. In the case of multiple objectives a more sophisticated version of the tool could be used, the **weighted cost-effectiveness analysis**, which gives weights to objectives to measure their priority scale. Another alternative is a multicriteria analysis. The technique, which looks at the cost of an intervention, and relates it the benefits created, is also closely related to the use of a Value for Money Assessment. Notably, when assessing the value of an intervention, value for money does not necessarily mean achieving outcomes at the lowest cost.

Main criteria to estimate the CEA quality are: **(1) strong analysis of cost, (2) good enough analysis of effect(s), and (3) comparison involving costs and effects**.

A handbook on Cost-Effectiveness Analysis was also prepared under the same project as the present Working Paper ("Development of the capacity for the Cost-Benefit Analysis", project financed by ERDF through the Technical Assistance Operational Programme). For information on when and how to apply this method please consult this handbook.

2.2.3 EXPERT PANELS

An "expert panel" is a specially constituted work group that meets for evaluation. Expert panels are usually made up of independent specialists recognised in the fields covered by the evaluated programme in the evaluation process, usually as a mechanism for synthesising information from a range of sources, drawing on a range of viewpoints, in order to arrive at overall conclusions. To some extent, the expert panel draws largely upon legal practices in that results are usually based on reaching a consensus of opinion. Expert panels are a means of arriving at a value judgment on the programme and its effects, which incorporates the main information available on the programme, as well as numerous previous and external experiences.

The panel may be considered as an evaluation tool in so far as there is a standard and reproducible procedure for forming it, bringing it together and leading it to produce its conclusions. Inspiration for the tool was based on university juries and this explains why it appeared in the early 1970s - in the field of Research and Development programme evaluation (The Delphi survey technique also relies on experts but differs in several other respects).

Other characteristics of this approach include:

1. The panel consists of a diverse group of individuals;
2. Each panel member has equal access to high quality information;
3. Each panelist carries out his or her own analysis;
4. Each analysis is shared with the rest of the panel (usually anonymously); and,
5. Panelists have an opportunity to revise their initial analysis after reviewing other panelist's findings.

The experts are chosen to represent all points of view, in a balanced and impartial way. These experts are independent specialists, recognised in the domain of the evaluated programme. They are asked to examine all the data and all the analyses made during the evaluation, and then to highlight consensus on the conclusions that the evaluation must draw, and particularly on the answers to give to evaluative questions. The panel does not fully explain its judgment references nor its trade-off between criteria, but the credibility of the evaluation is guaranteed by the fact that the conclusions result from consensus between people who are renowned specialists and represent the different "schools of expertise".

The tool is recommended when sufficient expertise exists in the field and when the evaluation is complex.

Expert panels are used to reach consensus on complex and ill-structured questions for which other tools do not provide univocal or credible answers. It is a particularly useful tool in relation to complex programmes, when it seems too difficult or complicated, in an evaluation, to embark on explanations or the grading of criteria In order to formulate conclusions.

It is also well suited to smaller, simple project/programmes, the evaluation of which does not warrant the mobilisation of many resources. The use of groups of experts makes it possible, within a few months, to gather the main points of view and knowledge relevant to the evaluation.

Box 2: Example: Swedish National Council for Technical Development

Since the early 1980s, the Swedish National Council for Technical Development has used the expert panel approach to evaluate the quality and relevance of development measures funding under programmes for the development of basic skills and knowledge.

The panels usually consist of five international experts who are recognised and representative of the diverse points of view concerning the programme, and who are able to make an undertaking to participate in all the panel meetings. The panel is chaired by an expert chosen from the group. The process of developing conclusions by the expert panel involves two main stages of research:

Firstly, examination of the programme documents concerning the resources mobilised (staff, equipment, finances), the research themes, results, publications and co-operation. At this stage the panel will interview a selection of beneficiary organisations.

Secondly, visits to the field are made by each expert, either individually or in groups of two.

In the final stage the panel draws up a joint report. If the points of view diverge, the panel discusses them until a consensus is reached. Experience has shown that the search for compromise inevitably softens the conclusions. However, the value of the evaluation is enhanced by the legitimacy of the panel's conclusions. Programme managers are invited to express themselves and the final report is then published. The tool is considered to be effective and inexpensive.

Source: Christensen, H.C (1987) "Evaluation of research Programmes", in E. Ormala (ed.) Evaluation of Technical Research and Development , pp. 88-108, Espoo, Nordforsk

3. CONCLUSIONS AND RECOMMENDATIONS

Using CBA for appraising non-major projects should be carried out taking into account the experience so far in financing major projects. CBA is an important tool that needs pertinent data on cost and benefits to provide useful information to take a decision to finance a project or not. The practice of using CBA for non-major projects is very eclectic so is needed a unifying approach for various types of projects. This is a difficult task due to the high diversity of projects.

In order to use CBA as a tool for selection process some preconditions should be in place.

1. **Preconditions for using CBA: creating a data base and methodology transparent for all applicants:**
    - **Unified data base (costs and benefits)**: existence of a unified list of cost and benefits for various categories of projects that should be used by all applicants; the applicants should provide an annex with values used in drafting the CBA and, if a new type of cost/and benefits is introduced to explain why and how was introduced/estimated; this data base should be used by all the operational programmes which require CBA for the evaluation of projects;
    - **CBA Verification**: clear procedure for examination/verification of the CBA while mentioning the unclear elements or the mistakes; drafting a Verification Report and a Correction Protocol for CBA;
    - **Excel sheets** that have formulas imbedded and the only need is to introduce the data of the project;
    - **Providing and using the same macroeconomic data** (exchange rate, inflation, GDP increase, family's income etc.); these data are available from specialized institution as National Commission for Forecasting and all applicants should use the same data;
    - **Other elements** as: sustainability of the company/project, standard calculation for residual value, commune time horizon etc.
2. **Replacing CBA with other techniques**

As the extensive use of CBA is not useful for all type of investment projects, especially for projects that have a social role (schools, churches, hospitals etc.) and for projects in which is difficult to determine the economic costs and benefits, some others techniques could be used in order to get the information needed to support the decision to finance a project or not.

In the next table such a proposal is presented.

For socio-cultural infrastructure projects such as hospitals and other health infrastructures, houses for elderly people, shelters etc; education and training infrastructures, museums and cultural sites, churches[10], monasteries, national parks and protected sites, with small benefits or hard to identify, the CBA is not relevant for the decision to finance or not.

[10] The author of this report did not found any international reference which would suggest using CBA for financing churches with other religious role. It is probable that this practice is only found in Romania because are admitted for financing not the effective religious objectives but the historical and/or cultural ones, which, because of their religious character had been neglected during the communist period.

Though, the Government Decision No 28/2008 provides its inclusion within the Feasibility Study. In this situation, a financial analysis is to be prepared, using the incremental method, so as the savings to be underlined, especially those related to energy and non-renewable resources. The indicators of the financial analysis (especially FNPV) will be used also in the option analysis, in order to justify the selection of the proposed option. The attention of the applicant, as of the evaluators, should concentrate on demonstrating the financial sustainability of the project and the applicant's capacity to implement and operate the infrastructure. To these, the sensitivity and risk analysis will be added.

A distinct category, but similar with the above mentioned categories, is including county and local roads, bridges, repairs and other works. Nor for this type of projects the economic analysis cannot justify the financing because the economic values are small. For example, through the Priority Axis No 2 of ROP around 800 km of county roads can be financed which means around 100 km/region. The 100 km at regional level are further divided at county level in 30-50 km roads.

Thus, the proposal for the **road infrastructure projects of reduced importance (category)**, CBA should be replaced by CEA. This method is easier to use and has the advantage to select the alternative which will cost the society less money. Thus, with the same amount of money more projects can be financed. In this case, also, a sensitivity and risk analysis will be added.

For **research projects**, we recommend to use the Experts Panel and/or the Multicriteria Analysis. For this type of projects it is very complicated and burdening to estimate the costs and external benefits so as CBA is costly and the final relevance of indicators is not certain. . In this case, also, a sensitivity and risk analysis will be added.

For **other projects under state aid rules**, we recommend to continue to use CBA, taking into account the above-mentioned pre-conditions. This new approach will include three steps. For the first step, the indicators of the economic performance will represent the eligibility criteria. If the project is considered to be eligible, then, in a second step, an Evaluation Grid, will be filled in. If a minimum set of requirements is observed, then, in the first step, the state aid should be modeled in correlation with FIRR/K so as to avoid the excessive profitability of the sums invested. If it is identified that the profitability is excessive than the EU grant must be reduced and the difference will be covered through a commercial loan.

For this type of projects, the EU contribution and the national/local contribution must be confirmed in advance.

A distinct category is made up by the rehabilitation/modernization projects for which the GD No 28/2008 does not provide the use of CBA and for which it is recommended the use of the Cost-Effectiveness Analysis or of the Multi-Criteria Analysis, based on the investment sector, for the analysis of the options. Exceptions in case of these projects are those for which exist special requirements and also methodologies for the monetizing of the impact (e.g.: projects related to renewable energies or energy savings, reduction of carbon emissions etc.)

For guiding the persons who prepare CBA and for the persons that evaluate, this analysis is important to create the institutional support for CBA by setting-up a Support Unit which could advise and offer guidance, instructions etc.

The economic analysis should be used on an obligatory basis for the projects valued between 5 and 50 million Euro, but a proper procedure for verification is absolutely needed.

Table 2. Proposal for CBA replacement in appraisal of projects

Type of project	CBA replaced by	Advantages
Socio-cultural infrastructure projects: • Hospitals and other health infrastructures, shelters etc; • Education and training infrastructures (schools, highschools etc.), • Museums and cultural sites, churches, monasteries, religious centers • National parks and protected sites • County and local roads	Cost-effectiveness analysis[11] (CEA) together with: - demonstration of the capacity of the applicant to ensure the financial sustainability of the project - sensitivity analysis - risk analysis	• Allows to select the project that bring the benefit with the lowest cost for society • Ensures efficient use of investment resources in sectors where benefits are difficult to value • Cost-effectiveness is very useful in evaluating interventions that aim to improve the health of a population • In the case of evaluation that requires joint consideration of multiple outcomes the weighted cost-effectiveness method should be used
Research projects as: • Research in fundamental science • Technological development • Innovation • Equipment for laboratories	Expert Panels /Multicriteria analysis[12] together with: - sensitivity analysis risk analysis	• The expert panel may be used to formulate an independent, authoritative judgment, which is particularly useful in a partnership context, especially if there are differences in the partners' views. • It is easy to manage

[11] Applied in the situations and in conformity with the methodology indicated in the Cost-Effectiveness Analysis Handbook, document elaborated within the framework of the same project as the present clarifying paper
[12] Applied in the situations and in conformity with the methodology indicated in the Multi-Criteria Analysis Handbook, document elaborated within the framework of the same project as the present clarifying paper

Other projects under state aide rule 1. Innovative and eco-efficient productive systems 2. Increasing energy efficiency and security of supply, in the context of combating climate change 3. Airports 4. Tourism 5. Telecom/ICT 6. Industrial estates and business parks 7. Productive investments	No replacement	**1. Open call for projects** CBA should be used but in a different way. Could be used an evaluation scheme in 3 steps: 1. Economic analysis is used in the eligibility phase with YES/NO outcome; financial indicators and sustainability would be used in the same way as in the case of major projects 2. Second step would be the Evaluation Grid with mainly technical and managerial criteria 3. Third step would be the calculation of FIRR/K and, in accordance with the result, the EU contribution will be modulated within the upper limit of the state aid scheme in order to ensure that the profitability of the applicant is not excessive. In cases of excessive profitability, commercial loans would be recommended to be used in combination with EU grants. **2. Call for projects with deadline for submission** The submitted projects may be included in the hierarchy based on EIRR or ENPV and a List of financed projects and a List of reserve projects should be kept.

4. ANNEXES

Annex 1. Financing schemes to be used in relation with normally expected profitability for projects to be financed by EFDR and CF

	Financing scheme		
Expected Profitability*	**Mainly loans (+ low grants)**	**Loans + Grants**	**Public grants**
Medium – high	– Airports – Energy – Tourism – Telecom/ICT – Industrial estates and business parks – Productive investments		
Medium		– Solid waste – Ports	
Medium- low		– Tolled roads – Public transport – Water supply and waste water treatment plants	
Low			– Railways – Health care – Education – Research, innovation and technology transfer
None			– Roads without tolls – Flood prevention

** Source: DG Regio*

Annex 2. Average external costs in 2000 by cost category and transport mode

Figures from INFRAS / IWW 2004

Average external costs in 2000 by cost category & transport mode

	Average Cost Passenger							Average Cost Freight						
	Road Car	Bus	MC	Pass. total	Rail	Aviation	Overall	Road LDV	HDV	Total	Rail	Aviation	Waterborne	Overall
	[Euro / 1000 pkm]							[Euro / 1000 tkm]						
Accidents	30.9	2.4	188.6	32.4	0.8	0.4	22.3	35.0	4.8	7.6	0.0	0.0	0.0	6.5
Noise[1]	5.2	1.3	16.0	5.1	3.9	1.8	4.2	32.4	4.9	7.4	3.2	8.9	0.0	7.1
Air Pollution	12.7	20.7	3.8	13.2	6.9	2.4	10.0	86.9	38.3	42.8	8.3	15.6	14.1	38.5
Climate Change High	17.6	8.3	11.7	16.5	6.2	46.2	23.7	57.4	12.8	16.9	3.2	235.7	4.3	16.9
Climate Change Low[2]	(2.5)	(1.2)	(1.7)	(2.4)	(0.9)	(6.6)	(3.4)	(8.2)	(1.8)	(2.4)	(0.5)	(33.7)	(0.6)	(2.4)
Nature & Landscape	2.9	0.7	2.1	2.6	0.6	0.8	2.0	10.9	2.0	2.9	0.3	3.8	0.8	2.6
Up-/Downstream[3]	5.2	3.9	3.0	5.0	3.4	1.0	3.9	22.4	7.4	8.8	2.4	7.4	3.3	8.0
Urban Effects	1.6	0.4	1.1	1.5	1.3	0.0	1.1	5.2	1.1	1.5	0.5	0.0	0.0	1.3
Total EU 17[4]	76.0	37.7	226.3	76.4	22.9	52.5	67.2	250.2	71.2	87.8	17.9	271.3	22.5	80.9

Average external costs of transport in the EU17 countries

Remarks:

1) The modal differences in noise costs are directly related to the national noise exposure databases used and thus might be subject to different ways of noise exposure measurement.

2) Average climate change costs for the low scenario (for information only, values not used to calculate total costs).

3) Climate change costs of up- and downstream processes are calculated with the shadow value of the "Climate Change High Scenario".

4) Total average costs calculated with the climate change high scenario.

5) Noise costs for freight trains might be under-estimated as the simplified traffic assignment procedure applied did allocate most freight trains to daytime traffic.

Source: The RAILPAG (Railway Project Appraisal Guidelines)., EIB., EU, 2010

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