

COST BENEFIT ANALYSIS AND ITS ROLE IN INVESTMENT PROJECTS IN AGRICULTURE

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Abstract: *The investment projects have of particular importance for the development and progress of an organization. The development of investment projects involves making a decision and the existence of financial resources. The agriculture has specific features and contributes significantly to the gross domestic product, which is why channeling the investments to agriculture must be a priority. In this context, the cost-benefit analysis is a useful tool for evaluation and analysis of the investment projects, contributing significantly to the decision making regarding the choice of the optimal project. The objective of this article is to highlight the importance of cost-benefit analysis for the projects investment financed by the European Union through the Rural National Development Program 2007-2013, under axis IV LEADER. The article is structured in two parts which contains theoretical aspects and a case study. Thus it is made an overview of the investment, funding sources of the investment projects, the investment decision, the relevance of cost-benefit analysis for the investment projects. The case study aims to analyze the relationship between the results of the investment projects which include cost-benefit analysis and those that do not include cost-benefit analysis.*

Keywords: cost-benefit analysis, agriculture, projects, investments, decision.

JEL codes: M21, Q14

Introduction

Investments are underlying the economic growth, producing revenue growth, resulting in an increase of consumption and savings.

Investment decisions are the starting point for any development strategy. The economic growth depends on a number of factors including productive capital, human capital, knowledge, social and political factors. All these development elements imply decisions making which involving currently spend economic resources in the hope of future benefits, distant and uncertain. Thus we consider that investment in agriculture generates benefits after a relatively long period of time, taking into account the specific activity.

In this context, in each project, regardless of the size, must pay a particular attention to the expected results in relation to costs, ie the cost-benefit analysis of the investment / action. Cost-benefit analysis is used mainly in the evaluation of projects due to the need to optimize public and european money spending. Moreover the cost-benefit analysis is an economic tool that helps decision making for project finance. CBA analyzes and describes in terms of costs, all benefits and results in order to achieve a goal.

The research hypotheses which we intend to check include:

- I1- any investment project must include CBA;
- I2- only major investment projects must include CBA;
- I3- projects that include the CBA in the selection procedure are more numerous than those that do not include CBA in selection procedure;
- I4- projects that include CBA analysis in the selection procedure are fewer in number than those that include CBA analysis in the selection procedure .

Research Methodology

The research methodology used in this article combines qualitative with quantitative research. We chose an approach from general to specific, from a theoretical presentation of the current state of knowledge to a case study based on data analysis and interpretation. In the first parts there is made an overall of the investment, investment elements, their funding sources focusing on European funds for agriculture, continuing with the peculiarities of investment decision in agriculture, relevance of CBA for investment projects and its essential characteristics. As a main research technique it is used the literature review, documentation in the relevant literature, the study of various articles, websites, guides, and other specialty materials.

To capture the interactions between the different elements and obtaining information on the subjects studied, we used the case study, data analysis and interpretation. The case study is divided into two intertwined parts. So that in the first steps we proceeded to the identification of two Local Action Groups (LAGs) from West Region, the selection was made according to their size. After that we proceeded to analyze the database provided by the two LAGs and contains 150 projects funded by LEADER axis IV from National Rural Development Programme (RDP) 2007-2003, for each project are listed a number of issues such as : value, expected results, the duration of the project, implementation stage. From 150 projects were selected 100 projects based on the following criteria: the value of the project, implementation stage (being selected projects already implemented or those who are in the final phase of implementation). For each projects we analyzed a number of important documents: application form, contract financing, addenda if is the case, progress reports, payment requests.

After analyzing these projects we group them into two categories who are relevant for the research topic: projects that include CBA, ie 20 projects and projects that do not include CBA, ie 80 projects.

The purpose of this analysis is to find answers to four key questions and relevant to the topic studied: compliance with budgetary provisions in terms of costs necessary to carry the investment, results achieved, the impact of projects, the cost benefits ratio. For each of the 100 projects, taking into account the two categories in which the projects were divided, we proceeded to centralize the findings/observations.

The investment role

In the literature, the investments are defined in different ways. One of the conceptual approaches of investment refers to "The investment means any expenditure made in order to obtain profit. So in a usual sense the investment can refer to the use of the money to buy the shares of a company or buying a house, land surfaces, even deposit a sum of money in a bank account in order to obtain a profit. All these economic transactions do not result in an increase in physical capital, they are in fact capital investments whose purpose is to make profit or obtain other advantages "(Cioarna, 2000).

The most general sense of the investment term is the expense, the french author P.Masse considering that the investment is an uncertain and actual expenditure that will produce effects in the future, most often uncertain.

A summary is presented suggestively, conclusive in one of the manuals of political economy, thus: "The golden rule of the economy endowment with capital- or, by investments are created the capitals- ensures accumulations for a stable economic balance, normal for the economic conditions, simultaneous with the highest level of consumption of the society members "(Cioarna, Cilan, 2006).

Any investment contains the following elements (Bogdan, 2004):

- a topic, person or entity that invests;
- an object that contains the means/resources in wich is invested;
- a cost, representing the funds allocated to the investment or effort made by the investor;
- the effect or economic value resulting from the investment.

The investments can be viewed as an expense or an advanced resource, meaning that it is currently used and will result in further effects.

The role and importance of investment in the current economic and social context are reflected in their functions, starting from the base, ie providing the financial and material support for the development, economic and social progress and continuing with those derived on increasing production capacity, creating new jobs, improving the material and technical base, development of material science, education, culture, health and other areas of social activities

Financing sources of the investment projects

Financing of investments is one of the most important aspects of the investment process, and refers to the establishment of funding sources, the proportion of co-source, the combination of sources that minimizes the total cost of funding etc.

The most important problems that arise in an investment project are (Cucu, 2008):

- Ensuring the financial resources;
- Choicing the funding sources in order to ensure a lower cost of the capital that will be use for the investemnt;
- Recovery of invested funds and reduce the duration of this recovery;
- Payment of loans and interest;
- Ensuring a high returns from the investment works.

In general, investments involve a lot of costs, so that it appear the problem of finding the necessary funding sources and evaluating their profitability, there are compared the financing costs are with future financial results.

Regarding the financing sources of investment, those are grouped generally into two categories:

- Internal sources of funding include: self-financing, issue new shares, new intake of shareholders, etc.
- External sources of financing include bank loans, leasing, projects funded by the European Union, other types of financing.

In the current economic climate where internal sources are relatively limited, external sources are difficult to obtain, we consider that european funds are an important source of financing investment projects in general and in particular those for agriculture.

The European Fund for Agriculture and Rural Development (EFARD) is a financing tool created by the European Union to support countries in the implementation of the Common Agricultural Policy. Common Agricultural Policy (CAP) is a set of rules and mechanisms that estabilish the production, processing and marketing of agricultural products in the European

Union, and pays a great attention to rural development. EFARD is based on the principle of co-financing private investment projects. The European funds for agriculture can be accessed under the key document of the National Rural Development Programme (RDP). CAP is based on two pillars. Pillar 1 aims market measures, the demand-supply adjustment, increase farmers' income through grants and aid in accordance with the requirements of the RDP. Pillar 2 covers the modernization of agriculture, rural development by financing viable projects with funding support measures from the National Rural Development Plan (RDP).

For the total budget of CAP in the period 2007-2013, Romania had available 3,6%, or 13.524 million euros. Of the total, 40,7% were allocated to Pillar 1 and 59,3% to Pillar 2 (Zahiu Thomas et al, 2010). Regarding the estimated financial allocation for the financial year 2014-2020 through RDP, it is 8.015 million euro.

Under RDP 2007-2013, there are four priority axes of financing projects aimed to develop the rural area. In RDP 2014-2020, there are 19 measures of financing projects aimed to develop the rural area. These funding axes from RDP are an important funding source for the investment projects aimed the developing of Romanian rural area by viable projects.

Particularities of the investment decision in agriculture

The decision is a dynamic process which has as objective the choice for several possibilities (variants) of a line of action to achieve a goal, given an economic and social efficiency as high as possible (Emilian, 2003).

For agriculture, as for any other activity, the decision making involves a complex process that consists of the following steps:

- identifying and defining the problem;
- defining objectives as a result of an initial assessment of the limitations;
- establish alternative measures of action from which is chosen the final decision;
- evaluation of alternatives consists of comparisons between alternatives, so that to the decision maker need to have a qualitative information in order to take a good decision;
- selection of an alternative;
- decision implementation, control and evaluation of results.

The investment decision is based on a technical and financial program, known as the investment project. The investment project is a complex and autonomous action program involving in the case of capital investments, purchase and operation of tangible and intangible assets.

The main features of investment in agriculture are based on the specific of the production, namely: the influence of natural factors, the existence of biological processes and organic production, the production and social character.

In the agriculture investment process, the economic decision go through several stages, depending on the level of efficiency calculations regarding optimizing the allocation of investment resources (Subic, 2003).

The first phase is focused on the investment decision guidance throughout the whole of agriculture, and later, on branches of production and the social and economic sectors. This step takes into account the social and economic aspect, in terms of development of productive forces, the competitive relations of production, increasing agriculture level in farms who are less developed, productivity growth, improve working conditions etc. Channeling investment in different directions depending on the production tasks and the economic effects in order to ensure the organization development.

The second stage refers to the orientation of the investment at the farm level when, according to production tasks from the future development of the farm, determine the investment objectives, taking into account the complex factors involved in the production

process. Among these factors are listed: natural factors, biological and agrotechnical and technological factors, work organization, production and social factors.

The third stage of decision refers the investment options using a complex system of economic efficiency indicators.

It can distinguish the following types of investment projects: innovation projects, expansion projects, projects of rationalization or increase productivity, strategic projects (Cucu, 2008).

In the case of the investment, the decision takes into account the rate of return on invested capital and marginal cost of capital. From a practical point of view, the situation is complicated by the following aspects: multi-profile of most modern organizations, the existence of several markets in which the organization operates, the existence of several equity markets and various interest rates. Therefore, the investment decision is a matter of choice between alternative (competing projects, multiple funding sources and other).

The importance of cost-benefit analysis for the investment projects

Cost-benefit analysis has appear in the nineteenth century in the US, in the literature is considered as a method of economic assessment of the environmental effects (environmental, social, etc.) of the investment projects in construction, industry, transport, tourism and agriculture .

Cost-benefit analysis (CBA) is a tool used to estimate (in terms of benefits and costs) the socio-economic impacts of actions, projects, being one of the most used methods in evaluating investment projects. The impact must be assessed in relation to the assumed targets.

The objective of cost-benefit analysis is to identify and quantify the impacts of the action or project in order to determine appropriate costs and benefits. All impacts must be asselation with the objectives, and in terms of financial, economic, social, environmental, etc. Costs and benefits are assessed by considering the difference between the scenario "with project" and the scenario "without project", called "incremental approach". After that the results are cumulatted in order to identify the net benefits and to determine whether the project is appropriate and should be implemented. So the CBA is a decision tool used for assessing investment utility.

Cost-benefit analysis proves its usefulness for choosing the optimal (economic, environmental, social, technological) investment projects. It should not be confused with income-cost analysis which allows choosing the optimal project from purely economic considerations. In both cases we are dealingwith indicators (Internal Rate of Return, net present value, revenue-cost ratio). The differente betwen cost-benefit analysis (CBA) and income-cost analysis (CVA) is that the first compared with the second takes into account non-monetary elements derived from environmental impact not only monetary items in a classical sense.

Cost-benefit analysis helps the decision maker to identify the projects that will maximize the benefits and thus to set the priorities according to which the projects will be implemented.

In the projects financed by the Cohesion Fund (CF) and European Regional Development Fund (ERDF), it is provided by Council Regulation (EC) No. 1083/2006, Article 40, paragraph e, the obligation to perform CBA for the projects with a total value of over 50 million euro. In this context, CBA is required to assess whether a project who fits into the goals of EU regional development policy is appropriate in terms of economic and if needs financing source to become financially feasible. More specifically, in the development and evaluation of the projects funded by CF and ERDF, the CBA has the following objectives:

- To prove whether a project deserves to be financed. CBA is used to determine the extent to which the project contributes to economic and social cohesion policy and in particular to the objectives of the program under which funds are requested
- To determine whether a project needs financing and to what extent.

In the context of preparation of investment projects, the steps that must be taken to achieve the CBA are: identifying and defining the investment objectives, options analysis, financial analysis, economic analysis, sensitivity analysis, risk analysis, presentation of results.

Council Regulation (EC) No. 1083/2006 provides at Article 39 and 40 of the obligation to perform CBA for the projects with a total value of 50 million euros (for major projects). Regarding non-major projects (with values less than 50 million euros), EC recommends to Member States to develop their own methodology for evaluation and selection.

The cost-benefit analysis of the investment projects financed from European funds must comply with the "Guide for cost-benefit analysis of investment projects" issued by the European Commission and the instructions provided by Working Paper no. 4 "Guidelines on the methodology of cost-benefit analysis" issued by the European Commission.

The cost Benefit Analysis is one of the most used methods in evaluating the investment projects. CBA is used to highlight two important issues: whether a project that integrates in the objectives of EU regional development policy is appropriate in economic terms and if needs financing to become financially feasible.

Also, there are two other requirements that are performed by cost-benefit analysis:

- determine the financial sustainability of the project and the organization that will receive funds
- highlights the profitability of the project.

Cost-benefit analysis can be seen as a useful financial tool for forming an documented opinion and decisions mking regarding financing investment projects from EU budget. The main advantage of ACB consists in its methodology that brings together the costs and benefits of a project, regardless of the type of effects that it produces.

It is known that assessing the financial viability of an investment project is carried out by indicators:

- net present value
- revenue-cost ratio
- financial Internal rate of return
- cash flow.

The analysis used in the CBA must be determined in relation to the society in which the project will have a relevant impact. An important issue to be considered it refers to the impact that the project will have, it can be considered impacts at local, regional, national and even EU level. In estimating the potential impacts of a project, there is always uncertainty. This should be considered and treated properly in the CBA.

An essential component that occurs in any project, regardless of scope and scale, refers to the risk. A detailed risk analysis is the basis for a proper management strategy, which will be reflected in the project structure.

Case study

Given the crucial role of cost-benefit analysis in the investment projects, we intend to realize an analysis of investment projects financed through NRDP which including cost-benefit analysis and those that do not include cost-benefit analysis. The purpose of this research is to determine whether there is a relationship between the goals assumed by the project and cost benefit analysis.

In order to determine the impact of cost-benefit analysis were examined 100 projects funded by axis IV LEADER of RDP 2007-2013 under different funding measures. The access to these projects was done through two Local Action Groups (LAGs) which have a portfolio of over 150 projects. In order to conduct the research, LAGs have provided a database with the projects from which were selected 100 projects based on two important criteria: project value (it were selected the projects with significant value, the minimum amount of a project being 50.000 euros) the implementation status (being preferred projects in the final phase or that have already been implemented). Before the selection of these projects, we study the site www.apdrp.ro and the Applicant Guidelines, the procedure manuals specific for each measures for National Rural Development Programme 2007-2013. After analyzing each project was concluded that of the 100 projects for private sector, 20 projects includes CBA and 80 projects don't includes CBA because it was not requested by the applicable procedure manuals. Also, it were examined some documents related to the project implementation, ie progress reports, payment requests.

The projects in number of 100 were divided into two categories:

- Projects that include cost-benefit analysis, which is required by the applicant guide;
- Projects that do not include cost-benefit analysis, by the applicante guide it is not required to perform cost-benefit analysis.

Later in each project we tried to find an answer to four questions presented in Table no. 1.

Tabel no. 1

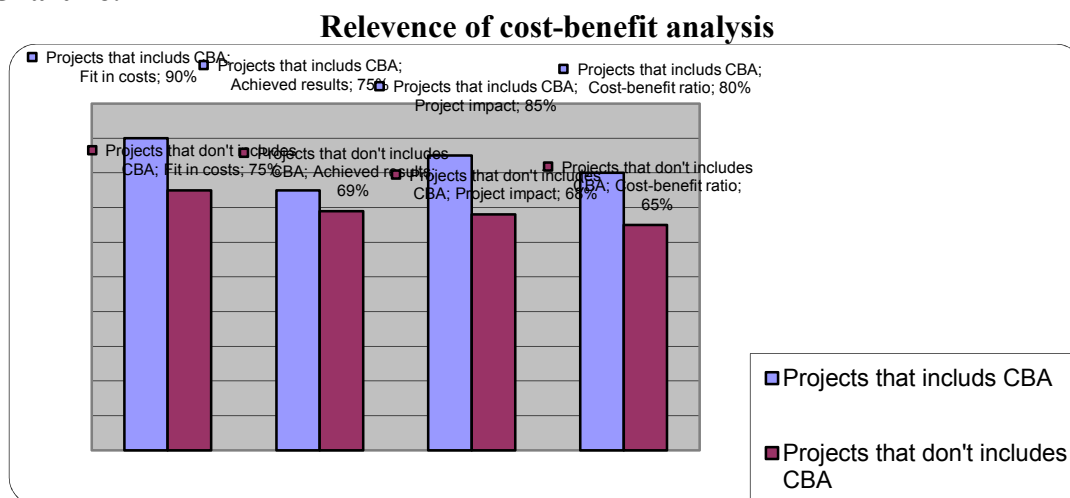
Findings centralization

Questions	Answers			
	Projects that includes CBA		Projects that don't includes CBA	
	Yes	No	Yes	No
1.The investments fits in the project budget?	18	2	60	20
2. The results assumed by the project have been achieved?	15	5	55	25
3. The project had a beneficial impact on direct/indirect beneficiaries according with the indicators assumed by the application?	17	6	54	26
4.The ratio between benefits and costs was positive?	16	4	52	28

Source: author's view, tata collected by the authors from the projects/reports

Graphical representation (in percent) of the importance of CBA is highlighted in chart no. 1.

Chart no. 1



Analysis and interpretation, obtained results

From the data presented in the above table can be drawn some important conclusions regarding the importance and impact of cost-benefit analysis for the investment projects.

So that out of 100 projects considered only 20 (20%) projects include cost-benefit analysis because only for those was requested by the Applicant Guide to accomplish this analysis. It is easy to deduce that this analysis was required for large projects.

Regarding the framing of the investments in the amounts budgeted in the project, it appears that the situation is different from the projects that include CBA and those that do not include this analysis. So out of 20 projects which include CBA only 2 projects (10%) were not framed in budgeted costs, meaning that required additions funds. Of the 80 projects that don't include CBA, a significant proportion did not meet budgetary provisions, the amounts budgeted for various investments were not in line with market prices, ie 20 projects (25%).

If we refferre to achieve results undertaken by the project, it is noted that 75% of projects that include CBA reached their predetermined results while projects that do not include CBA only 69% of projects have achieved all targets, resulting that CBA has a beneficial impact on projects offering the best orientation for the costs incurred and expected benefits.

Regarding the impact of projects on direct and indirect beneficiaries, the tendency is that projects with includes CBA have a more positive impact than those that do not include CBA. So 85% of projects that include CBA generated a positive impact (eg creating new jobs, capitalize of the resources/existing products in rural areas, the growth and diversification of the rural economy, etc) while projects that do not include CBA only 68 % generated positive effects. This situation is explained by the fact that in the case of projects that include CBA have reached the highest part of the proposed results and fit within the budgeted costs which means a beneficial impact and positive effects on rural areas.

If we refer to the ratio between benefits and costs of the 100 projects, it is easy to deduce that this ratio is closely correlated with the answers provided to the first three questions. So in the projects that include CBA, the ratio between costs and benefits is positive

in 80% of cases while in the projects that don't include CBA only 65% registers a favorable ratio between costs and benefits. It is important to note that this ratio refers to comparing the present value of future benefits to the present value of future costs.

It is important to note that in all projects financed through NRDP are required certain elements of cost-benefit analysis, for example: defining objectives in accordance with the financing measures, financial analysis, economic analysis, presentation of results. But there are not included some of the most important elements, like risk analysis, sensitivity analysis, options analysis.

Conclusions, future research directions

To start an action/investment project involves making decisions behalf of certain data more or less concrete. More specifically the decision-making process includes a comparison of cash outflows (costs) and cash inflows (benefits) generated by a project, which benefits most often are uncertain.

CBA is an important tool that requires specific data on costs and benefits of the project in order to provide useful information in the decision making related to fund or not a project. We appreciate that the use of CBA is not useful for all kinds of investment projects, such as projects that have a social role (schools, churches, hospitals, cultural institutions), low value projects (ie less than 10.000 euros), the project in which is difficult to determine the costs and benefits. For these types of projects can be used other information to support the decision to fund or not a project.

Based on the above mentioned, it proves to be true research hypothesis II and I4, so that from the analysis performed is clear that the CBA has to be done for most of the investment projects. Also it is found that the projects who includes CBA the selection procedure are fewer than those who includes CBA in the selection procedure (hypothesis no. 4). Moreover, the projects that includes CBA meet their results, fit in the predictd costs in a higher proportion comparing with the projects that do not include CBA. On the other hand we should not overrated the importance of the CBA, there are other methods of project evaluation and measurement of costs and benefits.

Council Regulation (EC) No. 1083/2006 provides that the CBA is made only for projects with a value who is exceeding 50 millions euros, means large projects such as those funded through the Regional Operational Programme (ROP), Sectorail Operational Programme Environment (SOP). The possibility that projects funded under the RDP to rise to this value is very low. However under certain guidelines for the financing measures for RDP, is requested to achieve the CBA, as Measure 313 "Encouragement of tourism activities".

It is important to note that this article is a continuation of a research initiated earlier this year and which refers to the analysis of economic efficiency of investment projects in agriculture, continuing with this research aimed at highlighting the importance of CBA for investment projects. This research will be developed by extending the CBA, achieving macroeconomic research, conducting case studies of ACB, cost analysis used in the CBA.

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