

USING ACTIVITY BASED COSTING FOR INVESTMENT DECISIONS

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ABSTRACT: *This article presents one of the most common tools in making investment decisions - Activity Based Costing (ABC). For this, we focused in the study on the literature review and practice using the ABC method in funding to establish investment decisions. We use for exemplification a project financing with the objective based on upgrading a hotel through complex arrangement works, achieved in order to obtain European funds. The basic information used for the cost-benefit analysis we access using the financial layout related to the funding measure that was desired accessing grants, information found in the financial statements of the company. The accuracy of the method used for this evaluation depends on the accuracy of financial statements provided by the hotel that reflects the work. Thus, our results have allowed us to establish clearly the investment situation, but equally the sustainability and reliability, confirming the need of the hotel analyzed to access grants.*

Keywords: *Activity Based Costing, project financing, financial statements, indicators, investment*

JEL codes: *E22, O22, M40, G30*

Introduction

Due to continuous changes occurring in the investment environment, we considered it appropriate to present this environment, the use of cost-benefit analysis, through timely reporting - past and present - and by combining theoretical factors with practice.

The main purpose of the ABC method is to provide information to facilitate management decision making; to analyze the cost of products, services and processes; to measure costs of used resources to increase revenue, productivity and efficiency in the use of these resources.

In order to broaden knowledge about the studied phenomenon, we considered it appropriate to use a series of research methods, from a methodological perspective. Methods, techniques and processes of research used in this preliminary research were based on review of specialty literature, documenting which involved studying the rich documentation in the field, observing, and for the practice was used mainly preliminary collection and processing of data from financial statement, analysis and synthesis and interpretation of data obtained. The paper supports the type of information generated by quantitative research, which attempted to highlight the peculiarities basis of theoretical perspective, but we see also a tinge of qualitative research, a

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comprehensive view confirmed through graphs, tables and interpretations contained in study case.

The main objective is to see how to use a cost-benefit analysis in a study on implementing a project for a hotel that wants to achieve internal and external upgrades through renovations and additional equipment.

Literature review

Cost-benefit analysis (Boardman, Greenberg, Vining, Weiner, 2004, pp. 151-152) is a method of assessing a policy that quantifies in monetary terms the value of all the consequences of this policy on all members of society.

ABC method appeared in the United States in the late 80s, in "The hidden factory", developed and published by Jeffrey G. Miller and Thomas E. Vollmann. These two authors subjected to a critical study areas and places of common costs (indirect), concluding that the decisive step for controlling indirect costs is to develop a model which details and structures the causes of these costs. However, they have developed and introduced a new system of cost calculation. (Ebbeken, Possler, Ristea, 2000, p. 363; Sorin Briciu, Florentina Sas, 2006, p. 9).

Cost-benefit analysis is a very useful tool for decision-making of allocating resources for publicly funded investments. In Romania, in the coming decades will be needed very large investments in order to cover the difference between the existing infrastructure in the country and what is found in European Union countries. Cost-benefit analysis can help public decision maker to identify projects that will maximize net social benefits and thus to determine the order of priorities according to which the infrastructure works will be carried out. (Guide to Cost-benefit analysis of investment projects, p. 2).

Mainly in the context of the preparation and evaluation of projects financed from the Cohesion Fund and European Regional Development Fund, the European Commission asks for cost-benefit analysis (National Guide for cost-benefit analysis of projects financed from structural instruments, p. 6):

- To determine whether the project deserves to be financed;
- To determine whether a project requires co-financing.

A cost-benefit analysis can be decomposed into six stages (Dumitru, Calu, 2008 p.199; Carmen Gros (Scotia), Mariana Farcas Bogdan Victoria, Diana Balaciu, 2005, p. 454):

1. Identification of the resource groups contributing to the activity;
2. Estimate the total cost of each resource group;
3. Estimation of the normal capacity of each group of resources in terms of working hours;
4. Calculation of unit cost of each resource group by dividing the total costs of those groups to the normal capacity in working hours;
5. For each activity, determine the time required based on inductors time and the characteristics of actions;
6. Costing inducers of time by multiplying the unit cost of resources with the necessary time to perform the work.

Cost-benefit analysis is a large scale usage (Jean Drez, Nicholas Stern, 1987, p. 909) aims to determine the financial and economic profitability of an investment project and its sustainability. Investments can be productive and non-productive. In real life it can happen that a project to be financially profitable, but not economically. In this context, the project does not serve society and cannot be financed. On the other hand, are projects that are not financially

profitable, but profitable in economic terms, which mean that the project generates incremental benefits to the society. Such projects should enjoy broad support and benefit from the grant.

Cost-benefit analysis shows a cost accounting system, built around the concept of activity, being another formula for establishing a full cost (Ionascu, Philip, Stere, 2003, p.57).

The main purpose of the ABC method is to provide information to facilitate management decision making; to analyze the cost of products, services and processes; to measure costs of used resources to increase revenue, productivity and efficiency in the use of these resources (Grigore, Nicolae, Giju, Mitran, 2010, p. 54).

From various studies consulted, we concluded that the ABC method was therefore promoted and adopted by various organizations as a basis for strategic decisions and at the same time to increase their performance (Robert Kaplan, David Norton, 1992; Peter Turney, 1992; Cooper, Robin, Robert Kaplan, 1991). The management method of cost-benefit enjoyed particular attention and is considered by specialists a breakthrough in cost management (Popa, 2005, p. 34).

Since 2015, the term "costs-benefit analysis" is no longer used, being taken to "analyze and financial investment forecast", or "cost-effectiveness analysis for projects of micro-enterprises" (Guide for Applicants - specific conditions for accessing funds Annex 1.5 - The business plan).

Currently, investment analysis and financial forecast includes the following sets of data and analysis (Applicant Guide - specific conditions for accessing funds, Annex 1.5 - The business plan):

1. Analysis of the applicant enterprise - the current situation
2. Project budget and financing plan
3. Financial analysis of investment
4. Analysis of the applicant enterprise - financial projections

Part of the required data model will be introduced in standard spreadsheet format (Excel worksheet) attached to the model of the business plan (analysis and financial forecasting). All values are entered in lei. The forecast data is based to the actual values (in constant prices, without taking into account the impact of inflation). Data is entered only in cells shaded in gray. Changing calculation formulas could lead to rejection of the application. The time horizon for which the financial projections are made is 10 years.

Implementation of cost-benefit analysis on the case study

Steps proposed to achieve cost-benefit analysis in the context of preparing investment projects are as follows (National Guide for cost-benefit analysis of projects financed from structural instruments, p. 5):

- Identifying and defining investment objectives;
- Analysis of options;
- Financial analysis;
- Economic analysis;
- Sensitivity analysis;
- Risk analysis;
- Presentation of results.

The calculation method and scales limit to be respected are as follows (Annex 12 - Specifying assumptions that were the basis of preparation of financial projections, pp. 4-5.):

1. *The investment value (VI) = total project value net of VAT* is taken from the project budget;
2. *Operating income (Ve) = income from ordinary activities*, as objects of the applicant. Retrieving values from the Annex 1 "Revenue Forecast" row "Total operating revenue" for the periods in question;
3. *Operating expenses (Ce) = costs related to current activity*. Retrieving values from the Annex 2 "Expenditure Forecast" row "Operating expenses – Total" for the periods in question;
4. *The rate of the operating result (rRE) must be at least 10% of Ve for years 2-5.*
The result from current activity (Re) is calculated: $Re = Ve - Ce$

The rate of the operating result (rRE) is calculated as follows: $r_{Re} = \frac{Re}{Ve} \times 100$

5. *Period of return on investment (Dr) must be 12 years old;*
This indicator expresses the payback duration (in years).
It is calculated as follows:

$$Dr = \frac{VI}{\left(\sum_5^1 Flux_net_actualizat + \sum_{12}^6 Flux_exploatare_actualizat \right) / 12}$$

It is believed that in 6-12 years cash-flows from exploitation are equal to cash flow from operating since year 5.

6. *The rate of return on invested capital (rRc) must be at least 5% for years 2-5;*
It is calculated as follows:

$$r_{Rc} = \frac{Flux_exploatare}{VI} \times 100$$

7. *The cash flow coverage ratio (RAFN) must be $\geq 1,2$ for 2-5 years;*
RAFN = operating cash flow / (interest payments + leasing + debt repayments)
Are taken from the cash flow table for the forecast period Appendix 7 among P "Cash flow from operating activities" which are subdivided in row C "Total outflows of liquidity by funding".

8. *Borrowing rates on medium and long term (rI) must be less than 60% for years 2-5;*
It is calculated as ratio between the total medium and long-term debt and total assets.

$$r_I = \frac{TD_i}{TA_i} \times 100$$

where:

TD_i = total medium and long-term debt in the year i;

Tai i = total assets during the year i.

9. *The discount rate is 4%, used for future discounted cash flows.*
 where:

r is the discount rate equal to 5% ($r = \text{interest rate by refinancing the ECB (1\%)} + \text{margin risk country (4\%)}$) rated by AM as mean value and will be re-evaluated as the European monetary market conditions changes, it is necessary to introduce a uniform approximations)

10. *Net Present Value (NPV)* must be positive;

It is calculated as follows:

$$VAN = \sum_{i=1}^5 \frac{FN_i}{(1+r)^i} + \sum_{i=6}^{12} \frac{FN_i \exp lt}{(1+r)^i} - VI$$

where:

FNI = net cash flow in year i ;

FNI explt = operating cash flow in year i ;

VI = value of investment.

Referring to funding sources we believe that as the most important: the contribution of the beneficiary, the public contribution and other sources beneficiary that can divide into internal sources (loans, bonds, private partners) and external sources (contribution of other European institutions, the contribution of other international organizations) (John Moise Achim, Teodor Hada, 2007, p. 175).

In this case study we are talking about a company with high potential for development, with the object of activity essential for Regional Operational Programme objectives, being in the list of competitive areas identified in the National Strategy of Competitiveness and Regional Development Plans. The development and consolidation of this enterprise depends essentially on an upgrade of current activity respectively modernization works of the hotel. This modernization will allow the adaptation of hotel services to the requirements and competitive pressures both on the market of local hotel, the main competitor today.

Ensuring good positions in the hospitality industry or ranking among the top companies of similar size that offers the same range of services is one of the preconditions for this project. So to achieve this objective, after analyzing the current situation of the company, it has realized that without the improvement and modernization of services of accommodation is increasingly harder to keep on top as long as appearing services more competitive in the market and as long as the requirements are becoming more stringent.

This project aims to improve the current conditions of accommodation that can be considered an innovative product / service given that semnfictiv accommodation services will be improved. Provision of furniture with fire detection installation, chiller and modernization works inside and outside (new carpet flooring, painting, cladding tiles, etc.) will improve comfort for customers who will benefit from semnfictiv upgrades.

Economic and financial analysis within the projects financed from European funds complement the business plan or feasibility study - economic forecast, the forms set out in the applicant's guide funding for each program separately.

Results and discussion

In determining cash flows and indicators of economic and financial analysis it has been started by retrieving data from the financial statements in the financial layout of the financing program. This model is in the Excel format and mathematics achievement is automatic.

According to economic situations in the past three fiscal years (2013, 2014, 2015) it can be seen from figure 1 below an positive economic growth, so that in these three years it has grown progressively. Thus, compared to 2013, last financial year turnover increased by about 43 percent.

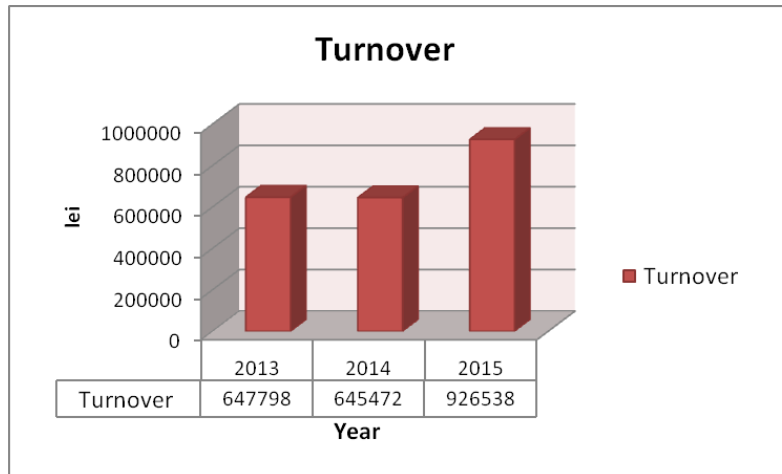


Figure 1. The evolution of turnover at SC X SRL between 2013-2015

Source: processing authors, Annual Financial Statements of SC X SRL

Whereas 2014 SC X SRL decided to expand the hotel by building a new wing of the building, together with existing hotel according to FIG. 2 below, 2014 it has been a loss of 26.740 lei. This loss was due to investments made for the construction of the new wing of the hotel. In the last financial year, 2015, the company decided to cut spending by proposed investment, so that the financial result it has been positively concluded at the end of 2015, recording a profit in the amount of 81.418 lei.

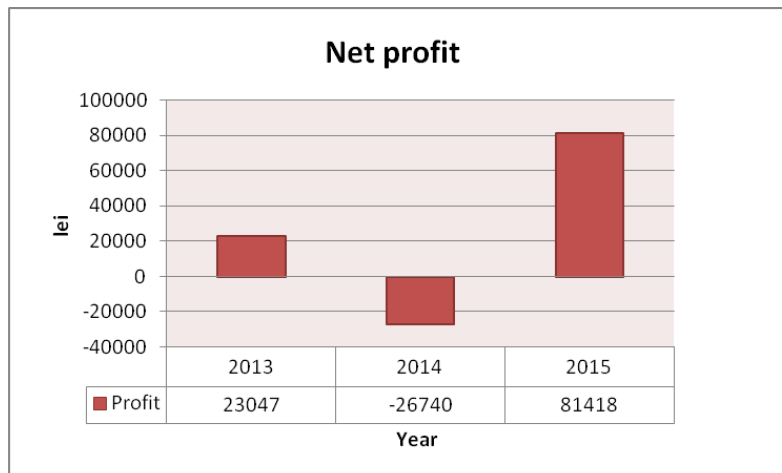


Figure 2. The evolution of net profit at SC X SRL between 2013-2015

Source: processing authors, Annual Financial Statements of SC X SRL

Another indicator of economic performance that highlights positive developments at the economic level SC X SRL refers to equity, which in FIG. 3 below on the period under study (2013, 2014, 2015) fluctuated positive. Also, the number of personnel was maintained during 2013, 2014 and 2015 according to FIG. 4 below, the company increased the number of human resources with another person.

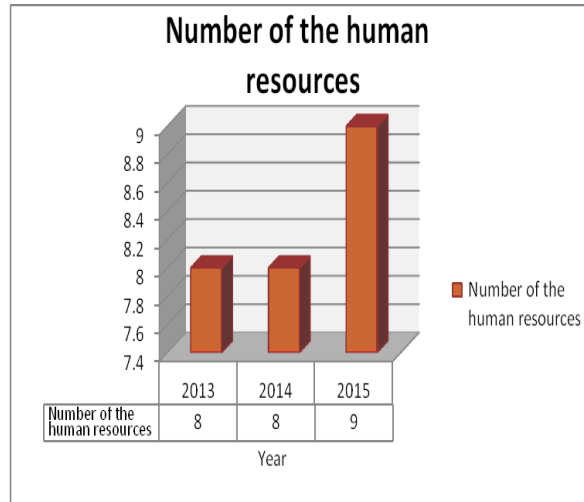
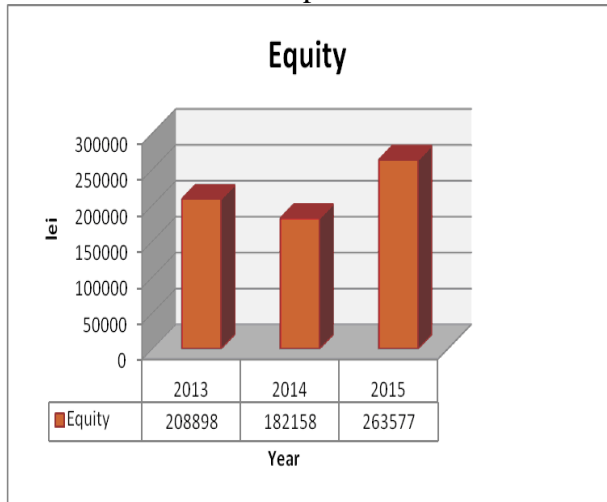


Figure 3. The evolution of equity at SC X SRL between 2013-2015

Figure 4. The evolution of the number of human resources at SC X SRL between 2013-2015

Source: processing authors, Annual Financial Statements of SC X SRL

On indicators of solvency and profitability, following the economic analysis of company X SRL is the following:

- solvency indicators - Overall Solvency Ratio

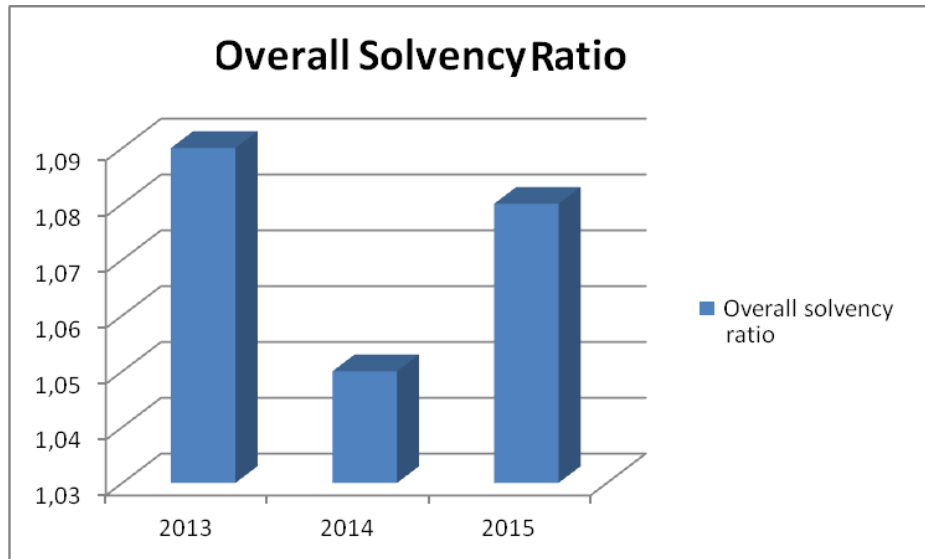


Figure 5. The evolution of overall solvency ratio at SC X SRL between 2013-2015

Source: processing authors, Annual Financial Statements of SC X SRL

According to the chart above, the overall solvency ratio SC X Ltd. presents a positive development from the value of 1.09 in 2013 and decreasing slightly in 2014 to € 1.05. This is due to sustained investment by the company on their own. Completion was reached in the 2015 the threshold of 1.08. Given that the solvency ratio increased compared to 2014, we can say that the company is on an upward trend which will ensure payment medium and long term maturities.

- indicators of profitability - return on assets (ROA) and return on equity (ROE)

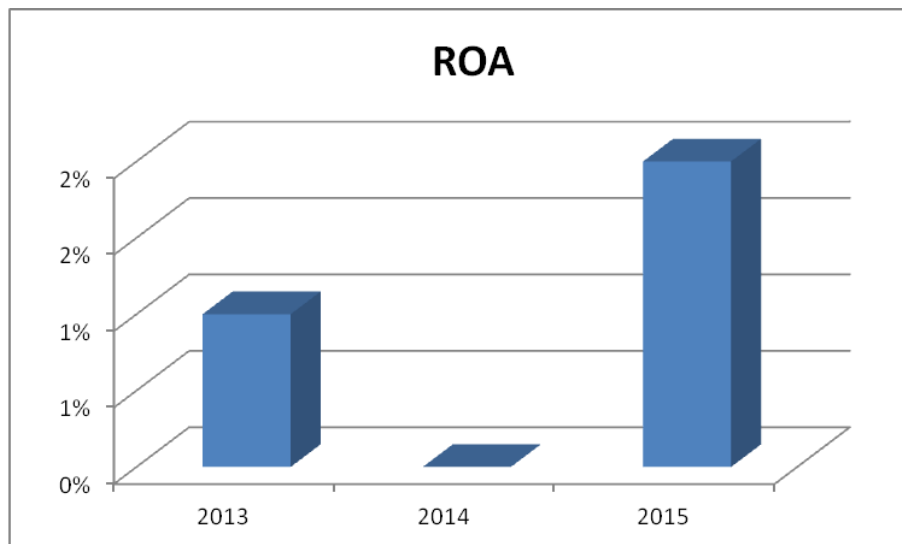


Figure 6. The evolution of ROA at SC X SRL between 2013-2015

Source: processing authors, Annual Financial Statements of SC X SRL

A company with high debt and a low financing from the money shareholders will generally have a higher return on equity than the one that finances over shareholders. The

advantage is to obtain a higher return on the investment from shareholders same account, but the disadvantage is the higher risk that it gives a high dependency debt. According to the chart below in Figure 7 it can be seen that despite the fact that in 2014 the company had a loss, it recovered very quickly from the poor state it was in, getting to the end of 2015 profit significantly improved profitability equity of over 30%.

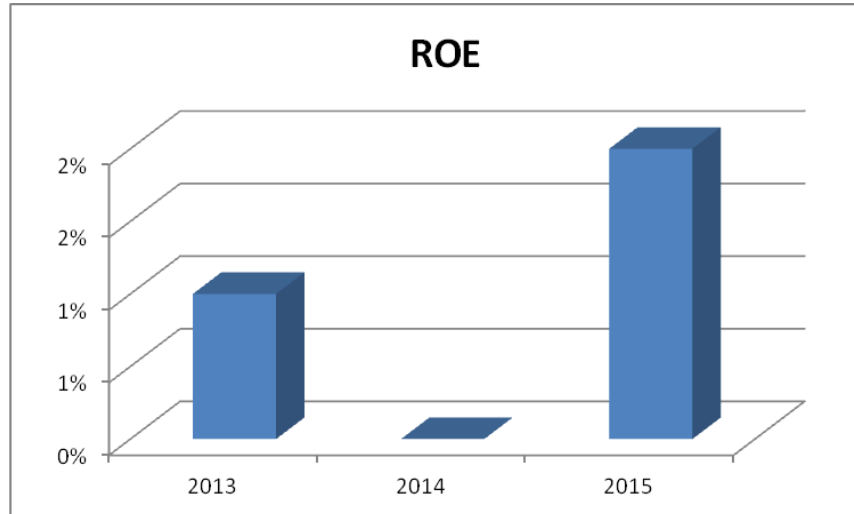


Figure 7. The evolution of ROE at SC X SRL between 2013-2015
Source: processing authors, Annual Financial Statements of SC X SRL

By implementing this project X SRL company wants to upgrade its capacity of accommodation through extensive interior and exterior renovations, furnishings and equipment, installation of solar panels and Chiller, as well as a fire detection installation. Through this project the company did not change in any way the object of activity under which functioned so far, so supporting this project will be based on experience from the company's foundation to the present.

Company X SRL chose as a result of carrying out this research directly to the market, offers the lowest price, to create a budget that allow for the 20% co-financing. Estimated investment costs relate to a value of 1,334,762.49 lei total amount of the grant application. For the two years of implementation, it estimated the following costs:

Table 1

Financing project implementation costs at SC X SRL

Cost	Year 1	Year 2
Consultancy	22,272.04	22,272.05
Construcions and plumbing	655,154.10	218,384.70
Accessories	-	410,679.60
Advertising costs	1,500	4,500

Source: Annual Financial Statements of SC X SRL

Consulting services expenses were estimated correlated with the chart scheduling activities, thus 50% of the first year and the rest in year 2. Construction and installation work,

costs were estimated taking into account also the chart activities. Thus, since the completion of the interior and exterior, equipped with chiller and detection system Fire PSI begin in the first year, arising during nine months, it estimated a cost of 75% of the budget line. The remaining 25% remains for the second year of implementation it is to acquire the building and chiller plant and fire detection.

Expenditure facilities were also estimated according to schedule activities so that the entire amount has been set for Year 2, because until the completion of the fittings inside and outside can not do this activity. At the same time, and advertising costs were established as Gantt chart so that in the first year charges are 1,500 lei, related to publication of the notice of commencement of the project and sophomore had an estimated value of more than 4,500 lei, whereas place so the purchase of promotional material and purchase of the newspaper publication of the notice of completion of the project.

All investment spending is necessary because the hotel requires modernization of these significant improvements. The cost is not at all a threat to society.

Investment financing plan for the modernization of the hotel, owned by SC X SRL. To conduct modernization and significant improvement of the services it offers its customers were provided in this draft performing development work outside and inside, equipped with chiller and detection system Fire PSI, purchase of furniture for hotel rooms, but also investing in energy efficiency system, equipped with solar panels, in order to achieve energy savings, all totaling 1,334,762.49 lei value.

Reimbursable financial assistance is 80% of the total eligible project, namely 887,841.68 lei. In addition to this amount, the company comes up with a co-eligible expenditures 20%, respectively 221,960.41 lei, plus VAT on eligible and ineligible costs. It noted that the budget line 4.1 Construction and installation there is an ineligible expenditure of 2,500 lei, fully supported by the beneficiary.

Project funding sources come therefore requested non-reimbursable financial assistance in the amount of 887,841.68 lei, and the applicant contribution to be made by means of contracting a credit line for the project worth 446,920.80 lei. The loan was estimated contract period of 10 years with an interest rate of 5% / year and the first year of lending was estimated grace period and interest rate payment.

The hypothesis regarding the evolution forecast for the entire entity if the entity would continue to work with the implementation of the investment project is the fact that SC X SRL will continue to provide hotel services as far throughout the forecast period.

For drawing up the forecast, state financial data of the last financial year 31.12.2015. Over the forecast period was estimated to increase turnover by about 30% compared to the value at 31.12.2015.

To achieve financial projections without adopting the investment project was started with the idea that the company X SRL will keep the average tariff per year of service accommodation of 175 lei, while the number of accommodation will increase each year by 1%. The sale of goods

is expected to values similar to those in 2015, much lower than income from accommodation services. Thus, these goods will increase revenue increasing by 1% every year.

If operating expenses, was started from the idea that the consumption of raw materials and consumables can not estimate the exact values, given the specific company activity, consumption being played virtually the number of rooms occupied a year. The increase from year to year forecast was 1%. Also considered was the maintenance of staff until 10 forecast. It predicted an increase in the basic salary of 1% per year.

If the entity would implement the investment project, the assumptions that go primarily relates to increased turnover by over 30% at the end of the period. This increase in turnover will be possible due to significant modernization and increasing hotel occupancy thereof.

For the first two years of analysis, the implementation, the economic situation is identical to the situation without investment, because basically can not speak fully the benefits of upgrading to completion.

Following the implementation of the project would reduce costs by 60% natural gas system due to mounting energy efficiency with solar panels. Wage costs would increase after the 2nd year, the last year of implementation due to the employment of five people looking for a stable job. This increase would not affect in any way the economic situation of the company as its revenues grow significantly after completion of the arrangement than version without the project, and natural gas costs are reduced quite a lot compared to the version without the project.

It is estimated that:

- unit price of the accommodation charge will be the same in the years of implementation, it will then Creaca estimated value of 180 lei / night
- amount of accommodation sold per year increase in the years of implementation Year 1 and Year 2 1%, then the growth will be 2% per year due to significantly improve the services provided and the completion of works underlying this investment
- thus the company will achieve a significant increase in revenue at the end of the review period, which contributes to strengthening its position in the market of hotel services and strengthen customer confidence

According to financial layout, cash flows are positive the entire period, except for the first two years of design as investment work place that require an effort from society.

Table 2

Cash flow situation

Cash flows	Implementation and operation (years)									
	1	2	3	4	5	6	7	8	9	10
Net Cash	-542.000	-519.758	50.779	54.245	58.351	62.564	66.884	71.314	75.856	75.856
Residual value										922.844
Total cash flows	-542.000	-519.758	50.779	54.245	58.351	62.564	66.884	71.314	75.856	998.701

Source: Annual Financial Statements of SC X SRL

It also was calculated the net present value and internal rate of return financial financial as follows:

Table 3

Determination of net present value and internal rate of return

-lei-

Financial discount rate	4%
	Total
Total cash from operating	1,527,640
Residual value*	922,844
Total receipts	2,450,484
Total payments from operating	900,025
Investment	1,284,218
VAT regularization	-115,352
Total payments	2,068,891
Net cash	381,593
Net cash updated	21,280
Investment updated	1,001,699
VANF (financial net present value)	21,280
RIRF (financial internal rate of return)	4.30%

Following the results obtained, it can be seen that the situation arising as a result of the cost-benefit analysis is very good and provides access to grant the company concerned. That said the proposed project qualifies for funding from grants.

Conclusions

As a result, we concluded that the ABC method is one way of refining system cost and among the concepts most important promoted by this method are "activity" and "inducing activity", as shown in bases ABC method made Harvard Business School by Professor Robin Cooper.

This study was conducted on the basis of financial statements of SC. X SRL. for a period of three years - 2013 to 2015 to establish whether the company meets the optimal conditions for accessing funds, therefore, is making an investment decision using the ABC method.

We concluded that the company analyzed X SRL. It presents a favorable economic situation that fulfills all the conditions required to access EU funds. Increasing profitability and profit is vital that the company can keep up with the competition in the hotel industry. Any new investment should entail costs that must be recovered for the good economic development of society. All these can be accomplished by folding the services offered on the stringent requirements of the client. Thus, by offering competitive and quality customers the company may raise its profit as a result of satisfaction received from acquisition products.

Reflecting this research brings novelty in literature by addressing issues chosen for study that may be of great use to academics, researchers, economic and others, and also is useful for

practitioners, specialists in financing from EU funds and companies seeking to access funds, which can simulate in advance if it is within normal limits.

In this article we limited study of only one instance issues in using the ABC method, but in everyday life and other situations may arise that can be used for cost-benefit analysis for making investment decisions.

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