A NEW APPROACH FOR THE ECONOMICAL EFFICIENCY CONCEPT FOR INVESTMENTS

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ABSTRACT
According to the current interpretation, the economic efficiency of an investment project is defined as a category expressing the ratios established between the value and the structure of resources assigned for the execution of a project and the value and quality of useful effects which will be obtained (Ionita et al., 2003). We consider that the definition has certain limits, because it does not express the new type of European development, based on the market economy, having the fundamental objective to accelerate the increase of the general efficiency of the productive activity. As a result, it is imposed a mentality change for the formulation of the final analysis and assessment system for this economical category. For this, the author proposes to preset a new interpretation of the concept which will consider the principle of the systemic approach of the efficiency of an investment project, considering that the effects of an investment process occur not just on the investor, but on the whole economy.

KEYWORDS: *efficiency, indicator, investment, optimization, project.*

JEL CLASSIFICATION: *A13, E16, E17, E22, G10, O11, O41*

1. INTRODUCTION

The investments have been, and always will be, the basis of the development of the organizations, with a special importance for the development and increase of the production factors from the perspective of the quality.
For the economy of a country, the investments represent the effective material support of the economic increase and development, ensuring the operation at constant parameters, the development of the production of goods and, implicitly, the increase of the quality of life for the population.
The activities of the productive organizations – especially those in the investment domain, can not be assessed just from the perspective of the direct internal results, because the product, service or investment objectives are not goals in themselves, but means to satisfy the social demand. That is why, the real efficiency of the economic or social organizations is also manifested outside them, at the end users of the products and services, and in the impact on the ecological balance. Being a dynamic process, the economical efficiency, including the one from the area of management, is permanently driven by the scientific progress (Ionita & Blidaru, 1999). As a result, the new products and technologies, methods of leading and management which are generated by the process, cause, by the higher level of efficiency, the moral wear of the existing ones. This is why, the efficiency must be regarded from the perspective of the future, thus removing the risk situations (Ciocoiu, 2014).
Even if the specialists must consider the potential risk for the investments, they must chose solutions with regard to the organization of the risk management and the procedures to control the respective risks. This is why, the one that must ensure the management and administration of the risk must be a good practitioner, economist and legal adviser (Nicolescu et al, 2003).

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2. THE CONCEPT OF THREE SIDED EFFICIENCY

Starting from these premises, we must observe that the economic efficiency of the investments has several sides for expression, closely connected, but each having a specific role and their own indicators for measuring and assessment. The sides, which will be analyzed in the following paragraphs, regard the efficiency of the same organization, but from different angles.
The first side assesses the efficiency of an organization, regardless of the profile, by its internal activities, reporting the value of the products and services created to the consumption of resources and it is measured using the indicators work productivity and production costs. These indicators are compared with the achievements from the prior periods and the ones of the competition.
Work productivity (W). Any calculation for the economic efficiency considers this indicators as a basic element for the investment decision because, as the ratio between the value of the production and the number of employees, it represents, essentially, a direct comparison between the useful effect (production) and the effort required (consumption of resources–number of employees). In the investment practice it is inconceivable to consider an investment option when it does not ensure a higher level of work productivity, compared with the achievements recorded for similar objectives, executed before. This indicator answers to the criteria for economic efficiency of the investments and expresses, basically, the efficiency of social labor, determining the fundamental options that generate the progress of the whole society.
The increase of the work productivity is materialized by the obtaining of additional income and, at the same time, leads to the increase of the fixed assets.
Any investment option, in order to be accepted, must offer, mainly, the competitive productivity. For this indicator are used as calculation relations, the following formulas:

$$W = \frac{F_t}{q}; \qquad W = \frac{q}{F_t}; \qquad W = \frac{q}{N_s}; \qquad W = \frac{N_s}{q}; \qquad W = \frac{Q}{N_s} \tag{1}$$

in which: F_t–time required to obtain a quantity of production;
q–quantity of production obtained in a time interval.
N_s–number of employees
Q–value of the production obtained.

The work productivity must be considered a premise for the obtaining of the production and not as its consequence. The determining factor for the increase of the work productivity in the production activity is the technical progress, the work yield, quantity of goods obtained in the time interval, duration of the operations related to the movement of the goods etc. depending on it. The technical progress is currently strongly highlighted by the success of the digital domain, respectively the electronic processing of data.
The work productivity, in the area of goods productions, is expressed in two ways:

a) By the quantity or value of the goods production executed by a worker in the time unit: $W = PM / N_p$; where, PM–production of goods obtained and N_p–number of workers from the economic objective;

An example is presented in Table 1.

Table 1. Example of work productivity calculus

Nr. crt	Specification	UM	Period under review		Symbol
			2014	2015	
1.	Commodity output	Thousands RON	14.847	20.043	PM
2.	Number of personnel	Persons	23	26	N_p
3.	Total man-days	Man-days	4.945	5.980	$T_{man\text{-}days}$
4.	Total man-hours	Man-hours	39.560	47.840	$T_{man\text{-}hours}$
5.	W annual	Thousands RON/person	645	770	W_a
6.	W daily	Thousands RON/person	3	3.34	W_z
7.	W hourly	Thousands RON/person	0.37	0.41	W_h

Source: adapted from https://www.scribd.com/doc/112059065/Analiza-Productivitatii-Muncii (2002), p. 21

In the analyzed period, the three productivities – annual, daily and hourly –, are going up, on a background of increasing exercise and oscillation production staff.

b) By the consumption of labor (hours or days of work) for the execution of a quantitative or value unit from a product: $t = T / PM$, where PM–production of goods, T–total time for the production of PM, t–unit time.

The increase of the work productivity leads to the increase of the volume of goods produced, while using the same number of employees, which determines, at the same time, the decrease of the labor costs per unit of production. At the same time, the increase of the work productivity is the fundamental condition for the increase of the average salary and, implicitly, for a higher motivation of the workers for obtaining performances in the future activity. All these results are seen by increasing the quality of life for each worker.

The production cost reflects the actual conditions of economic effort for the execution of the designed production. It must be analyzed, both at the level of the whole recorded production, and at the level of each production marker, and equally, for the product unit. This indicator is also important from the perspective of the profit. If the production costs are reduced, it is obvious that the profit of the company will increase.

The production cost represents the costs required to execute a unit of product. The level of the production costs must present a descending tendency due to the promotion of the technical progress, the reduction of the specific consumptions, a better organization etc.

In order to compare between the achievements in time for an organization (the recorded progress) or between its achievements compared to another organization, we use the updating technique. This allows the knowing of the "equivalent of each sum of future economic effects at the chosen updating moments" (Romanu & Vasilescu, 1997). "The updating represents a dynamic method based on considering the change over time of the value (from the economic perspective), of the sums spent as investments and the ones obtained as profit" (Vasilescu et al., 1999).

The updating (discounting) method uses the following reasoning: If you invest one RON now in a productive activity which will have a giver efficiency "e", it will have, one year later, a higher value, according to the formula:

$$1 = 1(1 + e) \qquad (2)$$

in which "e" represents the profit which was obtained in the productive activity, spending the one RON invested initially. If this sum is reinvested in the following year, a profit higher than the one for the first year will be obtained, as follows:

$$(1+e)(1+e) = (1+e)^2 \qquad (3)$$

If the time factor is also considered, it will result that from one RON invested initially, over "h" years will be obtained the sum of $(1+e)^h$ RON.

„The expression $(1+e)^h$ is called the fruition factor and is used for the equivalence in the present of sums invested in the past, or in the future for sums spend today" (Ionita et al., 2003). If we calculate the resulting sum Y in the productive activity of an organization after a number of h years, for an invested sum X, we will use the formula:

$$X(1+e)^h = Y \text{ sau } I_{ta} = I_0(1+e)^h \qquad (4)$$

if we consider that X represents in the formula (4) an initial investment fund, and Y represents the value updated after "h" years.

Then, when analyzing for the future the economic efficiency of a productive activity, we will say that a sum Y obtained in the future, after a number of h years, will have as the initial investment a sum X, using the formula:

$$X = Y\frac{1}{(1+e)^h}\ , \qquad (5)$$

where $1/(1+e)^h$ is called the updating factor.

If we write as I_h the future expenses which will be made within the production activity, then it results that they, with equivalence by updating (I_{0a}) for the start of the production activity interval, will be:

$$I_{0a} = I_h\frac{1}{(1+e)^h} \qquad (6)$$

From the comparisons made can be deduced the progresses made by the organization with regard to the saving of resources, increase of competitiveness, position held within the domain. We will call this a first degree efficiency side.

The second side regards the internal activity of the organization, the effects determined, by the services rendered and products delivered, on the environment and to the beneficiaries and is evaluated by the environmental impact indicators and the products and services quality indicators, respectively, by their prices, efficiency in satisfying the requirements and needs of the beneficiaries (Ionita & Blidaru, 1999).

The sustainable development of the eco-efficient production is one of the most complex problems with social-economical responsibility for the authorities, investors and designers of the investment objectives, when the integration of the economic, social and environmental objectives appears impossible to achieve. The design has the decisive role for the sustainable development of the eco-efficient production, by the fact that it can perceive in advance the interdependence of the investment objective and the environment and accept that the environmental factor will direct the conception of the products and services, and the technology.

Due to the uneven distribution of the resources on the territory of the country and the economical differences between various areas, the integration of these objectives in the design by using rigid provisions established at the level of the whole country can lead to the progressive damaging of the ecological balance at the level of such areas. A pragmatic approach of the sustainable development

involves the use of renewable resources, especially if they are poor, with rhythms smaller or equal with the natural regeneration speed, and the use of the non-renewable resources must be optimized based on technologies.

The efficiency expresses, in this case, the capacity of the external management, especially the marketing quality, to focus, with regard to the structure and volume, the production of the organization toward the real requirements of the market, and also the adapting capacity to be able to satisfy on time the new requirements.

The management activity from the investment domain must lead to that type of thinking which focuses on the creation of values and satisfaction of the needs of the customers.

Are known several types of leadership (Nicolescu et al., 2003), among which we mention:

a) Lean Management, which involves the creation of partly independent groups, which will lead to an effective work form with a highly reduced hierarchical structure. The method provides economies for the long term, because the workers no longer see the promotion of the technical progress as a factor of reducing the number of employees, but a possibility of reducing the physical effort, increasing the quality of the investment works and increasing the incomes of the company and the personal ones.

b) The method of the organization based on profit centers, for the occurrence of a process of reducing the centralization and for delegation of responsibility, and also the decision power, promotion of the new, on an inferior hierarchy step.

c) The PORTFOLIO method, which is based on the lifecycle model for the product and which is formed from the following phases: Execution/creation, development, maturity and saturation. In each of these phases, the results of the investments contribute in a different manner to the realization of the turnover and the profit.

We will call this a second degree efficiency side. The connection first degree efficiency and the second degree efficiency is made using the profit and profitability factors. The profit, resulting from the difference between the prices and the costs, is an indicator of the second degree efficiency, and the cost, an indicator of the first degree efficiency, serves as the basis for the profitability calculation.

Comparing the two sides of the efficiency, results that the second one is the decisive one, because it considers the very objective of the production, to satisfy on time certain social requirements while obtaining a profit which will ensure the viability of the organization and the interests of the shareholders.

The third side of the efficiency, which will be called third degree efficiency, considers the evolution of the efficiency in the perspective, because the knowledge of the first and second degree efficiency is not sufficient. The organizations, economical branches and the whole national economy can conduct efficient activities in a certain period, but can not become incrementally ineffective when they neglect the research, assimilation of new technologies and products with superior yields, continue to use management methods which are obsolete, non stimulating, do not attempt to find the intentions and actions of the competitors. From this results the conclusion that, the assessment of the economic efficiency must be made considering the focus of the organization for the permanent implementation of a high level of efficiency.

The organization management must have a very clear vision on the longer term with regard to the production schedule and the possibility to execute this schedule. A permanent analysis of the phases for promotion of the technical progress creates a well documented basis for the following phases within a process of planning and development of the future strategies.

The creation of visions or an investment promotion strategy is a continuous process, which is permanently updated, depending on the newly developed situations for the inputs (materials, equipments, technologies etc.), the system (relations and methods used in the organization), and also for the outputs (both on the construction market and for the consumer).

A method for development of strategies to promote the technical progress which is also applied with good results for investments is the benchmarking method. This involves a comparison of the own activity of the organization with those of other top organizations and, implicitly, Implementation of their activity directions. This process of benchmarking (comparative analysis) demands answers for questions like: "how do others act", "why do the act like this", "in what conditions the other outperform us", "what can I improve from now on".
This method determines a progress which will be favorable to all, implicitly for the ones from which a new method is taken. Usually, are compared and improved certain departments within the organization, like: Logistics for supply of materials and raw materials, construction site activities, relation with the clients, technologies attracted and applied, methods for payment and motivation of the personnel etc.
A conclusion which must be remembered about the third degree efficiency is the following: For an organization, the lack of interest on the line of promotion and using of the technical and managerial progress, compared to its competitors, the continued use of obsolete technologies, with reduced yields and high consumptions of resources, thus entering the moral wear area, becomes the main source of waste for the resources and continuous reduction of the economic efficiency.

3. Applying the new concept in the analysis of the efficiency of the investment projects

The investment activity must be interpreted in the same manner. Thus, the operating manner of the fixed assets during the operation process and the efficiency level for the beneficiary will depend in a large part on the quality of the constructive, technological and organizational solutions selected during the feasibility study and technical project, and the execution of the objective. In addition, for the justification of the investment decisions must be considered, more than for other domains, the future requirements of the internal and external market, given the relative operating period for the fixed assets created. The superficial justification of the requirement and opportunity for the execution of the objective can determine to the complete canceling of the foreseen results or, in the best case, to additional efforts for the later adaptation to the real requirements of the market.
A first peculiarity of the applying of the new concept to the investment activities results from the existence of several participants to the investment processes and the obtaining of the results, which requires the differential analysis of the efficiency corresponding to the specifics and tasks assigned to each one. It is also required the specification of the positions for the analysis, which are, on one side, the ones of the participants to the execution of the project, as follows: Consulting, construction and national economy units (by the contributions to the execution and operation of any investment project and the participation to the benefits of the project), and on the other side, the beneficiary of the project and the market where the products and services obtained in the new facilities will be traded (Radu, V., 2008).
The first degree efficiency is achieved for the investments projects at the level of consulting and construction organizations.
The consulting organizations execute the works required for the technical-economic justification of the investment decision: Opportunity, pre-feasibility, feasibility studies and technical project.
The construction organizations execute construction-assembling works on the construction site, effectively executing the investment project. The analysis of the specific activities conducted by these organizations by first degree efficiency is made by comparing the investment efforts required to execute the project using the solutions proposed and used, with the size of the rendering capacity obtained, expressed in physical or value units. The level of the efficiency can be determined with the aid of the indicators: Specific investment, value of the fixed assets commissioned, economic effect of the resources involved (which is proportional with the size of the execution duration for the objective and the intensity with which the resources are assigned in time), and environmental indicators.

The specific investment indicator "ensures the compatibility between the investment effort made to execute an economic objective and the results obtained expressed by the production capacity (Vasilescu et al., 2000).

The calculation formulas differ, as such:

a) For new objectives: $S_i = I_i / q_i$

in which, S_i represents the specific investment;

I_i is the investment corresponding to the option *i*;

q_i is the annual production capacity corresponding to option i (expressed in physical units).

In this situation, the specific investment, thus calculated, shows the investment effort, in RON, which is made to execute one unit of physical capacity (ton, kWh, piece, square meter etc.).

b) For the activity of modernization, development or technological upgrade of the existing objectives: $S_i = I_{mi} / q_{mi} - q_0$

in which, I_{mi} represents the investment for the modernization, development or technological upgrade, for option i;

q_{mi} is the production capacity after the modernization, for option *i*;

q_0 is the production capacity before the modernization.

This indicator shows how many invested RON are spent to increase the production capacity with one physical unit.

c) In order to compare the options amongst themselves, is calculated the specific investment for each option in turn; are compared the values obtained, and is selected as the optimal option the option which presents the lowest specific investment: $S_c = (I_i - I_j)/(q_i - q_j)$

in which, S_c represents the specific investment for the comparison and expresses the requirement of additional investments for option i compared with option *j* to obtain an additional annual production capacity of one physical unit, for option i compared with option *j*;

I_i is the investment for the option *i*;

I_j is the investment for the option *j*;

q_i is the production capacity for option *i*;

q_j is the production capacity for option *j*;

Any project initiated must be analyzed, both from the perspective of the investor, at a microeconomic level, and from the perspective of the national economy, at a macroeconomic level. Although not contradictory, in a market economy, the interests, for the two levels, are different. If the entrepreneur aims mainly to obtain the highest profit for each RON spent, at a macroeconomic level, aside to this economic criterion, there are several important criteria: social, strategic, ecological etc. The priority must be granted to the analysis of the entrepreneur, because he is the one making the investment and production effort, and the state must have an active role, intervening with the aid of economic leverage, to also optimize the project at the level of the company.

Because any investment is a certain expense for the future period with elements of uncertainty, the evaluation of the economic efficiency must also have a sensitivity study for the proposed project, which is required for the final decision.

By comparing these indicators with the results obtained in the prior period, with the existing norms and the execution of similar units at a national and international level, can be assessed the efficiency of these organizations, the professional training degree for the employees, the technical level of the equipments and the quality of the internal management.

The second degree efficiency is manifested at the level of the project beneficiary and the national economy by the results obtained after the commissioning and operation of the objective. The assessment of the efficiency is made by comparing the technical-economic parameters obtained during operation with the ones established in the feasibility study and the technical project. For the assessment of this efficiency degree will also be considered the influence of the operation of the objective on the environment.

The indicators of the second degree efficiency are: the investment recovery term, the incomes-costs ratio, the updated net income, the internal profitability rate, the profitability indicator, the viability of the production installations.

The investment recovery term (duration) is an indicator expressing the time interval in which the investment is recovered from the profit after the commissioning of new production capacities.

The calculation formulas for the investment recovery term are:

a) for new objectives: $T_i = I_i / P_{hi}$

in which, T_i represents the recovery term for option *i*;

I_i is the investment corresponding to the option *i*;

P_{hi} is the annual profit related to the option *i*.

b) For the modernization, development or technological upgrade of the existing objectives, the calculation of the recovery term is made with the formula: $T_i = I_{mi} / P_{hmi} - P_{h0}$

in which, T_i represents the recovery term for option *i*;

I_{mi} is the investment for modernization corresponding to the option *i*;

P_{hmi} is the annual profit related to the option *i*.

P_{h0} is the annual profit before the modernization.

c) In order to compare the options amongst themselves, is calculated the recovery time for each option in turn, are compared the values obtained, and is selected as the optimal option, respectively the option which presents the lowest recovery term: $T_i = (I_i - I_j)/(P_{hi} - P_{hj}$

in which, I_i, I_j represent the investment corresponding to option *i*, respectively j.

P_{hi}, P_{hj} is the annual profit related to the option *i*, respectively j.

Example:

The company "Hidrotech" S.R.L. aims to develop and produce hydraulic pumps. It has two investment variants. It is required to choose the optimal variant using the static economic efficiency indicators, outlined in the tables 2.

Table 2. Information about investment

Nr. crt.	Indicators	U.M.	Variants	
			I	II
1.	The total investment (I_t)	Thousands RON	500	555
2.	Production capacity (q_h)	Pieces	400	450
3.	Annual production expense (C_h)	RON/piece	910	895
4.	Annual revenues (Q_h)	Thousands RON	550	610
5.	Duration of operation (D)	Years	5	7

Source: adapted from Vasilescu (1999), p. 59

The allocation of investment in presented in table 3.

Table 3. Investment allocation

Option I		Option II	
Year 1	35%	Year 1	40%
Year 2	65%	Year 2	60%

Source: adapted from Vasilescu (1999), p. 59

During the second year of achievement of the objective, was partially put into partly operation the production capacity, obtaining the results presented in table 4.

Table 4. Expenditures and revenue

Nr. crt.	Indicators	U.M.	Option I	Option II
1.	Annual production expense	Thousands RON	90	105
2.	Production value	Thousands RON	160	185

Source: adapted from Vasilescu (1999), p. 60

Table 5. Option 1

Indicators	U.M.	d_1	d_2	D_1	D_2	D_3	D_4	D_5
The total investment (I_t)	Thousands RON	175	325	-	-	-	-	-
Production capacity (q_h)	Pieces	-	200	400	400	400	400	400
Annual revenues (V_h)	Thousands RON	-	160	550	550	550	550	550
Annual production expense (C_h)	Thousands RON	-	90	312	312	312	312	312
Annual profit (P_h)	Thousands RON	-	17	181	181	181	181	181

Source: adapted from Vasilescu (1999), p. 60

Table 6. Option 2

Indicators	U.M.	d_1	d_2	D_1	D_2	D_3	D_4	D_5	D_6	D_7
The total investment (I_t)	Thousands RON	200	300	-	-	-	-	-	-	-
Production capacity (q_h)	Pieces	-	215	450	450	450	450	450	450	450
Annual revenues (V_h)	Thousands RON	-	185	610	610	610	610	610	610	610
Annual production expense (C_h)	Thousands RON	-	105	347	347	347	347	347	347	347
Annual profit (P_h)	Thousands RON	-	20	260	260	260	260	260	260	260

Source: adapted from Vasilescu (1999), p. 60

In the tables above was noted with d1, d2, the period of achievement of the objective and with the D1... D7, the years of operation.
So if we want to calculate specific investment, expressing investment effort made to obtain a unit capacity, physically expressed (pcs), we get:

a) $S_I = I_{tI} / q_{hI} = 500000 / 400 = 1250\, RON / piece$
b) $S_{II} = I_{tII} / q_{hII} = 555000 / 450 = 1233\, RON / piece$

The term of retrieve of investment (duration) expresses the time interval in which the investment is retrieved from the profit after putting into operation of new production capacities:

a) $T_I = (I_{tI} - P_{pI}) / P_{hI} = (500000 - 17000) / 181000 = 2.668\, ani$
b) $T_{II} = (I_{tII} - P_{pII}) / P_{hI} = (555000 - 20000) / 260000 = 2.057\, ani$

where, T_i represents the recovery term for option *i*;
P_{pi} is the partly profit (during the period of implementation) to the option *i*;
P_{hi} is the annual profit (during the period of operation) to the option *i*.

Economic efficiency coefficient expressing the annual profit that is obtained from the 1 invested RON and is calculated as the inverse of the recovery term:

$e_i = P_{hi} /(I_{ti} - P_{pi})$, where:

e_i represents the economic efficiency coefficient to the option i;
P_{hi} is the profit annual to the option i.

$$e_i = P_{hI} /(I_{tI} - P_{pI}) = 181000 /(500000 - 17000) = 0.374\,RON\_\text{annual profit from 1 invested RON}$$
$$e_i = P_{hII} /(I_{tII} - P_{pII}) = 260000 /(555000 - 20000) = 0.485\,RON\_\text{annual profit from 1 invested RON}$$

The ratio between incomes and costs (benefit-cost) gives the possibility of a comparison between the sum of incomes obtained for the whole operation period of the economical objective and the total expenses made, both for the construction and for the production (Vasilescu et al., 2000). Obviously, the updating technique is used in the formulas:

$$R = \frac{\sum_{h=1}^{d+D} V_h \frac{1}{(1+a)^h}}{\sum_{h=1}^{d+D} (I_h + C_h) \frac{1}{(1+a)^h}} \text{ sau } R = \frac{\sum_{h=d+1}^{D} V_h \frac{1}{(1+a)^h}}{\sum_{h=1}^{d+D} (I_h + C_h) \frac{1}{(1+a)^h}} \quad (7)$$

in which R, represent the ratio between the updated incomes and the updated total costs.
V_h is the income obtained for the year *h* (incomes from selling the base production and from other activities);
I_h is the annual investment;
C_h are the annual production costs;
a is the updating coefficient.
d is the execution duration for the investment objective.
D is the operation duration for the objective.
h is the duration, in years (1, 2, 3, 4, 5, 6, ... d+D)
The updated net income (VNA) is the indicator which allows the establishing of the difference between the total volume of the incomes obtained for the whole operation period of the objective and the total costs (with investments and production), updated values (Vasilescu et al., 2000). It is determined using the formula:

$$VNA = \sum_{h=1}^{d+D} V_h \frac{1}{(1+a)^h} - \sum_{h=1}^{d+D} (I_h + C_h) \frac{1}{(1+a)^h} = \sum_{h=1}^{d+D} [V_h - (I_h + C_h)] \frac{1}{(1+a)^h}, \quad (8)$$

in which, the symbols have the meaning provided at incomes/costs.
According to the BIRD requirements, all updating calculations are made when starting the investment works.
The internal profitability rate of the investment (RIR) expressing the discounting rate for which the total updated gross incomes are equal with the total updated costs (expenses for investment and production).

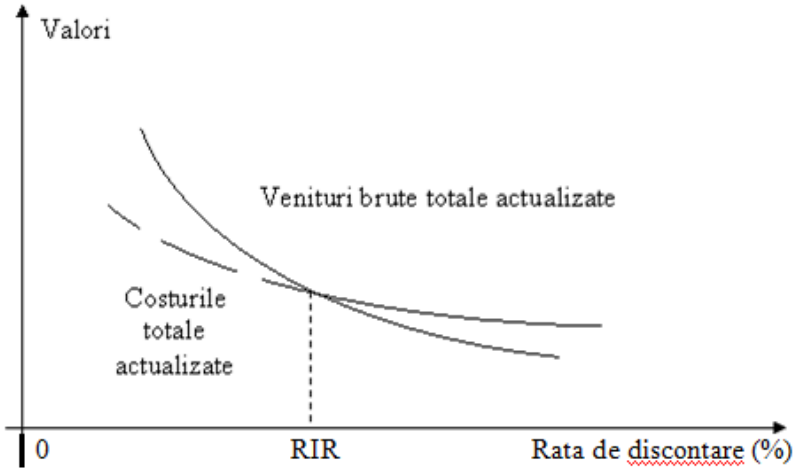

Figure 1. Evolution of total gross income and the production costs at various discounting ratios

Source: adapted from Vasilescu, I., Romanu, I. & Cicea, C., (2000, p. 231)

This is an indicator used in the analyses conducted on the efficiency of the investment projects, using the updating technique and expresses the level of the interest rate which balances the updated incomes with the updated expenses, and which makes the value of the updated net income to be equal with zero. BIRD uses this indicator for the analysis of the efficiency of the investment projects. The internal profitability rate represents the minimum threshold for a project, under which it is no longer efficient.

The level of the profitability can be established by graphical representation:

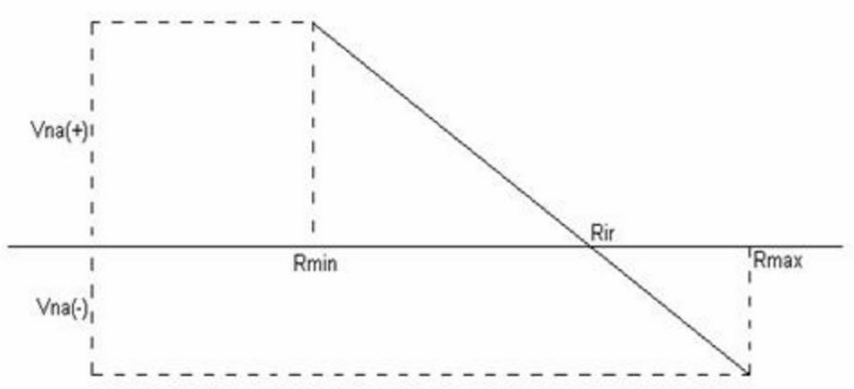

Figure 2. Calculation (graph) for the internal profitability rate

Source: adapted from Vasilescu, I, Romanu, I. & Cicea, C., (2000, p. 233)

For the analytical calculation of the RIR, is used the formula:

$$RIR = a_{\min} + (a_{\max} - a_{\min}) \times \frac{VNA_{+}}{VNA_{+} + |VNA_{-}|} \qquad (9)$$

where: RIR–internal profitability rate;

r_{min}–minimum updating rate for the updated net income with a positive value;

r_{max}–minimum updating rate for the updated net income with a negative value;

VNA(+)–positive value of the updated net income corresponding to the minimum updating rate; VNA(-)–negative value of the updated net income corresponding to the maximum updating rate; |VNA(-)|–negative value of the updated net income corresponding to the maximum updating rate, as a module.

The aim is to maintain a difference between r_{min} and r_{max} no higher than 5. A project is chosen using as the criterion its value, which must be larger or at least equal with the average interest rate on the market. The investment profitability is given by the value of the internal profitability rate, the higher it is the better for the investor.

The profitability indicator (IP) expresses the relative profitability of the investment for its whole duration, respectively the net updated value (VP_0) except the initial investment reported to the initial investment sum I_0. The calculation formula is: $IP = VP_0 / I_0$

The viability is the probability that the parts, components, products or system to execute the functions for which they were designed without malfunctions, in specified conditions, for a certain time period and with a given trust level. It is ensured in the manufacturing process by the proper selection of the technological processes and equipments, by observing the manufacturing status and conditions, by a rigorous check by phases of the quality of the raw materials and manufactured material. The viability is maintained by using proper measures for preservation, transport, commissioning and operation.

From quality perspective, it represents the capacity (aptitude) of the considered entity (system, installation, component, product) to fulfill the nominal operating requirements (specified function), in defined environmental and operating stress conditions and for a preset time period.

From a quantitative perspective, the viability is the probability that the system executes the functions for which it was designed and created, with a certain performance and without malfunctions, within a certain time interval and in given conditions, with an imposed trust level.

The second degree efficiency also characterizes the effects propagated at the level of the national economy by the execution and operation of the project. The indicators used for this case are: Number of direct and related work places created, value of the fees and taxes paid to the state budget, value of the interests for the investment loans, impact on the environment etc. In addition, the second degree efficiency also encompasses the contribution of the objective to the increases of the offer of goods and services to satisfy the direct and production consumption requirements, and the influence on the commercial balance, by currency saving, in the case of covering of some imports from the manufactured production.

Comparing the two sides of the efficiency, results that, just like for the investments domain, the decisive one is the second one, because it considers the final aim of the investment activity, which is to ensure the constructive, technical elements required for the production of goods and services corresponding to the demand of the market and the obtaining of a cash flow for the whole duration of the project, at a level which satisfies the expectations of the investor and ensure a proper participation to the covering of the general needs of the company.

The third degree efficiency characterizes the competitiveness of the objective for the whole operation duration and is ensured by the quality of the construction solutions and the operation of the objective prepared by the consulting organizations and executed by the constructor, and also by the actions undertaken by the beneficiary, during the operation period, in order to introduce the latest technical and managerial achievements. This type of efficiency is measured by the balance indicators.

The main balance indicators are: Total incomes, total expenses and even the turnover. The total incomes quantify all the incomes obtained by an issuer for each trimester, respectively: Incomes from the current activity, financial incomes (dividends, interests, positive differences from currency exchange etc.) or exceptional incomes (selling of assets, subventions, canceling of provisions etc.). If no exceptional incomes are registered, this is the turnover of the company. If the expenses are not structured efficiently, then the profitability of the company will suffer.

The third degree efficiency is also expressed by the effects generated by the construction and operation of the objective at the level of the national economy: Contribution to the development of the domain in which it belongs, and the adjacent branches according to the economical development strategy chosen by the government, attracting new natural resources in the economic circuit, increasing the productivity of social labor, improving the internal social climate and the economical and political position of the country internationally.

4. The contribution of the new concept to the increase of the justification degree of the investment decision

The proposed concept allows the justification of the investment decision, considering the efforts and benefits of all the participants to the construction and operation of the project. By the determination of the three degree efficiency the present and future importance of the project can be know better than in the current methodology, for the investor and for the other participants, eliminating the cases of rejection of the projects just because the direct efficiency – established at the entrepreneur level, is not satisfactory (obviously, we refer to the governmental projects, including the joint public-private partnership ones). There are numerous projects which, even if they don't generate a high efficiency at the level of the entrepreneur, corresponding to his requirements, when analyzed from the perspective of the effects generated within the environment in which they operate (on the horizontal and the vertical) can be efficient. Such projects are extremely opportune in the current period for the invigoration of the economy, because they have beneficial effects on the branches and companies with which they cooperate upstream and downstream, on the evolution of the unemployment and on the state budget by the taxes and fees paid. As a result, such projects should be supported by the state by adequate financial and loan policies, which will also allow an increase of the direct efficiency, at the level of the entrepreneur. In addition, it is highly required that the Romanian parliament will focus on adopting an encouraging legislation, attractive for the entrepreneurs, especially foreign investors, and the policy of the Romanian government should be focused on the support of the private entrepreneurs and the stimulation of the free initiative. The actions of the government must aim to consolidate a stable, coherent and predictable business environment, to eliminate the state monopolies unjustified from the economic perspective, to consolidate the free competition, increase the transparency of the business environment and the governmental policies, respectively the monetary policy, and to liberalize the labor market, which favors the development of the private sector, a real market economy, durable and opened to the outside. The efforts made for this can be easily recovered through the positive effects obtained within the economy after the construction and operation of the objective.

5. CONCLUSIONS

The calculation methodology and the analysis of the efficiency and opportunity of the investment projects currently used, are not sufficient to properly show the effects generated by a project at the level of the economy. Even if the current methodology (cost-benefit method) calculates and analyzes the financial efficiency (at the entrepreneur level) and the economical one (at the level of the economy), the system of indicators used is the same for both levels, which makes the economic efficiency established by this methodology to be, in fact, also a financial efficiency, but a rough one.

We appreciate that the correct determination of the efficiency of an investment project can not be made if the analysis of the efforts and affects for each participant to the execution and operation of the project and for this purpose are not answered by the third degree efficiency with the proposed indicators.

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