Methodology for Implementing the Investment Decision in the Certain Economic Environment

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Abstract

The purpose of the work consists in identifying the optimal decision-making option using the methodology of implementing the investment decision in the certain economic environment.
The importance of this research theme derives from the fact that investments, by their nature, have as their target the stimulation of economic growth itself and the development of social-cultural activities.

The topicality of this theme is also accentuated by the fact that, in the future, the investment process in our country will increase, so that the Romanian economy can face the economic crisis that is manifesting itself.

The purpose of this research approach is developed analytically through the following objectives:

- ✓ *Presentation of the evaluation indicators of investment projects, as well as the main financial elements of an investment in a certain economic environment;*
- ✓ *Highlighting the strategic character of the investment through the long-term impact triggered by the selection of the optimal decision-making variant.*

Key words: decision, investment, decisional alternative
J.E.L. classification: M21

1. Introduction

The enterprise, during the realization of its activity, pursues multiple and complex objectives. In the conditions of the market economy, the manager's actions are aimed not only at obtaining the highest possible profit in relation to the consumption of resources, but also pursue other aspects, according to a plan that includes primary objectives, secondary objectives, as well as intermediate objectives. It must be stated that there is a set of elements that can have a certain impact on these objectives.

The overall strategy of the firm is influenced by the existing type of market economy, promoted by the government, by the political options and the policy that the firm promotes.

Two factors are important for a successful investment:

- ✓ Investment policy and establishing investment objectives;
- ✓ Policy implementation through an appropriate investment strategy.

The conditions of monetary instability, of the exchange rate, the numerous legal-economic regulations, the problem of restructuring, the model of the new economy lead to a new definition of the investment strategy, which includes: objectives, strategies, mechanisms, all aligned with the change of the system in which it operates.

Thus, the investment policy, the choice of investment projects, goes beyond the purely financial framework. At the same time, long-term profitability is pursued, which is the main element of the investment activity.

The major changes, generated by the characteristics of a dynamic competitive environment, but also by the amplification of the globalization phenomenon, have put domestic organizations, public and private, in front of new problems and challenges, the solution of which requires experience and managerial skills.

2. Theoretical background

Investments are the most important stimulus for any economic activity. Within the national economy, investments constitute the fundamental element that initiates and develops any human activity, it represents what is the engine for an active system. The positive effects of investments for the national economy are not limited only to economic growth.

The word investment is synonymous, from a linguistic point of view, with: allocation, placement, endowment and so by extension we arrive at efforts made now in the hope of future rewards.

Investments can be defined in several ways, in a narrow definition, only expenses that materialize in a purchase of durable goods are considered investments. The notion of investment in this case symbolizes the acquisition of new fixed assets, tangible or intangible assets (Vintilă, 2009, p. 181). Understanding the notion allows the overlapping of an accounting view and a legal view on investments because only the patrimonial elements are retained in these two views regarding investments.

Regarding the role of the investment process in economic and social development, the object of investments is part of the set of requirements that are followed when determining the destinations of resources accumulated by society, respectively when determining the ratio between resources intended for development and those for consumption. The complex impact of investments in an economic system is also justified by the fact that companies that initiate investment actions and that implement various projects increase their supply of goods and services, which implicitly leads to additional income (Ciobănică, 2011, p. 121).

At the same time, any investment project generates additional needs or demands in related sectors, which causes a chain increase in income for all economic entities involved.

Some specialists believe that investments represent "an exchange between a present, certain monetary expenditure and a hope of receiving a flow of sums in the future". Through this definition we already position our vision of finance against the definition of the investment concept. Other specialists believe that the notion of investment involves three defining elements: duration, risk, efficiency. In order to obtain a complete and faithful image of the investment concept, the three-dimensional image of this notion must be studied: accounting, economic, financial.

As a recapitulation and synthesis of these opinions, the following general definition of investments can be materialized: "Investment is the current financial effort made for a better future, created through development and modernization, having as a source of financing the renunciation of safe but small current consumptions and non-performing, in favor of higher future consumptions and in a modern structure, closer to the users' options, but probable" (Postăvaru, 2006, p. 68).

3. Research methodology

The starting point in this research approach is the fact that the enterprise is nothing more than an investment portfolio for capital providers, associates and creditors, who considered that this allocation of resources is the best among the options available at the time of making the investment.

In order to substantiate the investment decision regarding the purchase of equipment specific to the production of furniture and furniture accessories, a series of research procedures were used, among which are found:

- ✓ Bibliographic documentation;
- ✓ The direct documentation of the economic reality and the gathering of the necessary information, through the direct contact of the primary documents, employees, specialists and persons of deisision from the company that was the object of the case study.

Regarding the data processing and treatment, the quantitative analysis of the available data was used, systematized by grouping and tabulation.

At the same time, the collected data were standardized and adjusted so as to allow the calculation of specific indicators in the process of substantiating and adopting the investment decision.

Qualitative analysis of data collected through quantitative methods was also used.

4. Findings

4.1 Presentation of the investment

The project proposes the financing of a capital investment to cover the expenses necessary for the purchase of equipment specific to the production of furniture and furniture accesories within CELINA company. The general objectives considered by making this investment aim at:

- ✓ The re-engineering and development of the current production of furniture and accesories in order to create a competitive product offer in terms of quality and manufacturing costs;
- ✓ Improving productivity considering the high levels achieved by furniture and accesory manufacturers from countriesthat operate on the same market as CELINA company;
- ✓ The specialization of production by market segments, in order to satisfy the demands of the customers regarding the quality of the products;
- ✓ Increasing the volume of sales on the market (forecasts for the expansion of contracts with business partners are favorable) after the installation of the new machines when the maximum capacities will be used;
- ✓ Increasing earnings so that the company can cover expences and maintain its viability throughout the life of the product;
- ✓ Improvement of environmental protection conditions.

The project consist in building a wood proccesing factory, namely a diverse furniture factory. The production capacity is presented in two variants:

- ✓ Option 1: 10.000 pieces of product/mounth;
  120.000 pieces of product/year.

- ✓ Option 2: 15.000 pieces of product/mounth;
  180.000 pieces of product/year.

Investment opportunity

As a part of the development strategy, the company proposed to build a furniture factory. The project is part of the restructuring program modernization CELINA company, regarding increase the profitability and competitiveness og the products offered by the economic agent on competitive markets. This investments aims to:

- ✓ The production of the neccesary accesories for furniture fittings from the company's production, as well as for sale (export);
- ✓ Production through modern technology, with performance machines and low costs;
- ✓ Abandoning the existing section, where the activity is carried out in inappropiate conditions and with outdated technology, however, some machines will be used in the new project.

The market and the product

The CELINA company has the possibility of increasing the current sales program, but the lack of product volume is one of the obstacles.

The conclusions of the market studies, as well as the forecasts regarding the development of the furniture industry, highlight an increase in the possibility of absorbing foreign markets, a fact that confirms the opportunity to create a new furniture factory.

Location

The furniture factory will be located in an area bordering the city of Constanța.

The financing plan

The capital to be invested was determined based on the estimation of each physical component and all related costs based on the estimates per object. The value equipment proposed for financing was evaluated according to their quotations in the offers of equipment suppliers selected according to criteria of technical performance and reliability.

The preliminary financing plan

Local investments will be borne by the company from its own sources or from internal credits, in the short term. The necessary financing for the renovation is proposed to be carried out from the credit, granted under conditions of repayment for a duration of 5 years, with 1 year of grace, with an annual interest of 15%.

Technological data

Two capacity options were studied: one considered as minimum feasible and another optimal so that the machines with high productivity are loaded:

- Option 1: 10.000 pieces of product/month;
- Option 2: 15.000 pieces of product/month.

The argument for the choice of the two processing capacities starts from the use of a modern technology with high-performance machines, in one version a minimum admissible load is achieved with the high-performance machines, and in the other an optimal load is obtained. In both variants, shown in table no. 1, the same profile and structure of production is considered.

Table no. 1 Presentation of production capacity

Specifications	Unit	Variant 1	Variant 2
Production capacity			
Monthly	pieces / month	10.000	15.000
Annually	pieces/year	120.000	180.000
From which:			
- Made of oak wood	pieces/year	6.0000	90.000
- Made of beech wood	pieces/year	40.800	61.200
- Made of resinous	pieces/year	19.200	28.800
Timber consumption, of which:	cubic meters / year	6.640	10.000
- beech timber	cubic meters / year	3.180	4.770
- oak timber	cubic meters / year	2.560	3.830
- resinous timber	cubic meters / year	900	1.400
Necessary personnel, of which:	man / day	17	30
Directly productive	man / day	15	28
Production hall area	square meters	5.400	4.480
Warehouse area finished products for 5 - 6 days stock	square meters	432	348
The technology investment totally sucks	Ron	1.400.000	1.500.000
Machinery from the country	Ron	1.400.000	1.400.000

Source: The investment plan of the CELINA company

From a technological and organizational point of view, the two options have in common a series of elements taken as a basis in the dimensioning and evaluation of the investment, namely:

- The technical equipment is the same from a technical point of view in the two versions, the difference being only the number of machines;
- The estimation of the investment value takes into account the existence of machines in good condition in the furniture factory to be used;

- The equipment of means of transport in the hall is similar in both versions: with roller conveyors, with the creation of a central stock specialized for types of furniture and landmarks - in the mechanical processing sector;
- Cooperating with clients on manual and mechanical sculpting and turning operations;
- Timber storage will be done on the existing bearings within the own platform;
- The timber is dried in the existing drying facilities;
- The storage of technical and auxiliary materials will be done in the new warehouse,
- The effects of applying a new technology are primarily reflected in the reduction of labor consumption per product between 35% and 55%, depending on the type of product.

It is also possible to achieve a reduction in timber consumption by 15-22% depending on the type of furniture produced. The main data characterizing the two variants are presented in the table. From the comparative data, the superiority of Variant 2 is highlighted. Thus, although the increase in production capacity in Variant 2 is 50%, the difference in the area of the hall to be built is smaller than that provided for in Variant 1 and in the case of technological investment the difference is 0 .7%.

4.2 Calculation and analyisis of the technical - economic indicators of the investment

The evaluation of the economic efficiency of the investment, by which it is provided the construction of a wood proccesing factory, constitutes the purpose of the economic analysis of the project. The designed level for both variants is presented in table no. 2.

Table no. 2 Variants of the technical-economic indicators of the investment

Crt. no.	Indicator	Unit	First variant	The second variant
1.	Total investment (It), from which:	Mil. of Ron	1.400	1.500
	- First year	Mil. of Ron	500	600
	- The second year	Mil. of Ron	500	-
	- The third year	Mil. of Ron	400	900
2.	Annual production capacity (q_h)	Mil. of Ron	120	180
3.	Value of production sold (Q_h)	Mil. of Ron	1.500	1.800
4.	Annual production costs (c_h)	Mil. of Ron	1.100	1.600
5.	Effective opperating time (D)	Years	10	10
6.	Annual profit (P_h)	Mil. of Ron	400	200

Source: The investment plan of the CELINA company

4.2.1 Evaluation of the economic efficiency of the investment with the help of the static indicators

In the case of the study, the execution duration of the works is three years and the operating duration of the investment objective is 10 years.

FIRST VARIANT

1) *Total investment (It)* is a volume indicator that quantifies the total investment effort made to achieve the objective. Iti is selected according to the minimum criterion.

I_t = 1400 mil. of Ron

2) *The duration of achieving the investment objective (d)* represents the time required to achieve the investment objective expressed in years. In economic theory, three ways of staggering the total investment during the realization are distinguished: increasing stagger,constant stagger and descending stagger. It is selected according to the minimum criterion (d = 3 years).

3) *The duration of effective operation (D)* represents the time that elapsed from the moment the fixed capital resulting from the investment is put into operation until the moment it is taken out of service or decommissioned. It is selected according to the maximum criterion (D = 10 years).

4) *The specific investment (s)* expresses the investment effort made to obtain a unit of capacity expressed in value. It is selected according to the minimum criterion.

$$s = I_t / q_h \quad (1), \quad \text{where}$$

I_t = the total investment
q_h = production capacity

s = 1400 / 120 = 11,67 monetary units invested per physical production unit (ron invested per piece)

5) *The payback period (T)* expresses the time period in which the investment is recovered from the annual profit. It is selected according to the minimum criterion.

$$T = I_t / P_h \quad (2)$$

$$P_h = Q_h - c_h \quad (3), \quad \text{where}$$

P_h = annual profit
Q_h = annual income
c_h = annual expenses

T = 1400/400 = 3,5 years

6) *The economic efficiency coefficient (e)* expresses the annual profit obtained per 1 ron invested, is calculated as the inverse of the recovery term. It is selected according to the maximum criterion.

$$e = P_h / I_t \quad (4)$$

e = 400 / 1400 = 0,29%

7) *Equivalent or recalculated expenses (K)* express the total effort (with investment and annual production expenses) made to obtain a unit of physical capacity. It is selected according to the minimum criterion.

$$K = I_t + c_h \times D \quad (5)$$

K=(1.400 + 1.100 x 10)=12.400 monetary units total effort

8) *The economic return (R)* quantifies the final profit (after recovery of the investment) obtained for an invested monetary unit. It is selected according to the maximum criterion.

$$R = (P_t / I_t) - 1 \quad (6)$$

R = (400 x 10 / 1400) – 1 = 1,86 ron net profit per 1 ron invested

9) *Specific expences (k)* quantify the total effort that goes back to a physical or value unit of production obtained

$$k = K / q_h \times D \quad (7)$$

k = 17.500 / (120 x 10) = 12.083,33 ron total effort per piece

THE SECOND VARIANT

1) *Total investment (I_t)*
It = 1.500 milion ron

2) *Duration of achieving the investment objective (d)*
d = 3 years

3) *Duration of effective operation (D)*
D = 10 years

4) *Specific investment (s)*

$s = I_t/q_h$ =1.500/180=8,33 monetary units invested per piece

5) *Recovery term (T)*

$T= I_t/P_h$ =1.500/200=7,5 ani

6) *Economic efficiency coefficient (e)*

$e = P_h/I_t$ =200/1.500=0,13 %

7) *Equivalent or recalculated expenses (K)*

$K=I_t+c_h$ x D = (1.500 + 1.600 x 10) = 17.500 ron total effort

8) *Economic return (R)*

R=(Pt/It) - 1 =(200 x10 / 1.500) - 1= 0,33 net profit per 1 ron invested

9) *Specific expences (k)*

$k = K / q_h$ x D = 12.400 / (180 x 10) = 6.888,89 ron total effort per piece

The interpretation of the results is presented in table no. 3.

Table no. 3 Economic evaluation indicators of investment options

Crt. No.	The name of the indicators	Indicators symbol	First variant (V1)	The second variant (V2)	Criterion of appreciation	Agreed variant
1.	Total investment	It	1.400	1.500	Minim	V1
2.	Duration of achieving the investment objective	d	3	3	Minim	V1,V2
3.	Duration of effective operation	D	10	10	Maxim	V1,V2
4.	Recovery term	T	3,5	7,5	Minim	V1
5.	Specific investment	s	11,67	8,33	Minim	V2
6.	Economic efficiency coefficient	e	0,29	0,13	Maxim	V1
7.	Expenses equivalent (recalculated)	K	17.500	12.400	Minim	V2
8.	Economic return	R	0,33	1,86	Maxim	V2
9.	Specific expences	k	12.083,33	6.888,89	Minim	V2

Source: The investment plan of the CELINA company

4.2.2 Evaluation of the economic efficiency of the investment through the lens of the size of the fixed assets

Financial theory indicates that in making the investment decision certain criteria can be found that lead to the use of one method or another. In general, the dynamic approach is a much better technique than the static approach in terms of considering these criteria.

The process of making investments and recovering the funds consumed takes place over time, the investments and their effects, as well as the level of efficiency, having a pronounced dynamic character (Doval, 2008, p. 198).

Since the investments currently allocated are no longer equivalent, under the influence of time, from a value point of view to the profit that will be obtained in the future, it follows that a concrete approach to the investment processes, in order to scientifically substantiate the decision, requires their dynamic analysis taking into account by the multiplying influence of the time factor.

For this, a phasing of the phenomenon under research will be carried out, the period in which the funds are consumed (in the presented case study, the funds are spent at the beginning of the period), so the correction factor (k) will be quoted during the calculations for the two variants of investment project to the value of 1.

The duration of the investment works is 3 years, and the operation of the objective is 10 years.

1) The size of total fixed assets (M_i) is an indicator that is obtained through calculations performed on the spent investment fund, the execution time of the objective influenced by the correction factor.

$$M_i = \sum I_h \times (d - h + k) \qquad (8), \text{ where:}$$

I_h = the investment fund spent in year h;
d= duration of the objective;
k=correction factor, with a value of 1.

2) The specific immobilization (m_i) expresses the immobilization belonging to a unit of production capacity.

$$m_i = M_i / q_h \qquad (9)$$

3) The average annual immobilization (m_a) expresses the level of the average annual immobilization and is calculated as a ratio between the size of the total immobilization and the duration of execution.

$$m_a = M_i / d \qquad (10)$$

4) Losses from fixed assets (E_i) reflect the unrealized effect as a result of the removal of investment resources from the productive circuit, with the help of the calculation relationship:

$$E_i = M_i \text{ x } e \qquad (11)$$

5) The specific economic effect of fixed assets (δ) is calculated to ensure the comparability of the warrants, by the formula:

$$\delta = E_i / q \qquad (12)$$

Knowing that the funds are spent at the beginning of the year, the calculation of the immobilization indicators is as follows:

Variant I

1) Size of total fixed assets (M_i)
d = 3 years, h = 1 year, I_h = 500 million lei

$M_i = [500 \times (3 - 1 + 1) + 500 \times (3 - 2 + 1) + 400 \times (3 - 3 + 1)] = 2,900$ million of ron total fixed assets

2) Specific fixed assets (m_i)
$m_i = M_i / q_h = 2,900 / 120 = 24,166.67$ ron immobilized per piece

3) Average annual fixed assets (ma)
m_a = Mi / d = 2,900 / 3 = 966.67 million of ron immobilized per year

4) Losses from fixed assets (E_i)
$E_i = M_i$ x e = 2,900 x 0.29 = 841 million of ron losses

5) The specific economic effect of fixed assets (δ)
δ = E_i / q = 841 / 120 = 7,008.33 ron losses per piece

Variant II

1) Size of total fixed assets (M_i)
Mi = [600 × (3 – 1 + 1) + 0 + 900 × (3 – 3 + 1)] = 2,100 million of ron total fixed assets

2) Specific fixed assets (m_i)
$m_i = M_i / q_h = 2,100 / 180 = 11,666.67$ ron immobilized per piece

3) Average annual fixed assets (ma)
m_a = Mi / d = 2,100 / 3 = 700 million of ron immobilized per year

4) Losses from fixed assets (E_i)
$E_i = M_i$ x e = 2,100 x 0.13 = 273 million of ron losses

5) The specific economic effect of fixed assets (δ)
δ = 273 / 180 = 1516.66 ron losses per piece

Knowing that the immobilization indicators are selected according to the minimum criterion, the data in table no. 4 will determine the choice of the optimal variant, in the situation where the funds are spent at the beginning of the year, so on the correction coefficient value k = 1.

Table no. 4. Efficiency of the investment through the lens of the size of the fixed assets

Crt. No.	Indicator	Variant 1	Variant 2	Criterion of selection	Agree variant
1.	The size of total fixed assets (M_i)	2.900	2.100	Minim	V2
2.	Specific fixed assets (m_i)	24.166,67	11.666,67	Minim	V2
3.	Average annual fixed assets (m_a)	966,67	700	Minim	V2
4.	Losses from fixed assets (Ei)	841	273	Minim	V2
5.	The specific economic effect of fixed assets δ	7.008,33	1516,66	Minim	V2

Source: The summary financial-accounting documents of the CELINA company

According to the presented table, we can specify that the determination of the economic efficiency of an investment project requires the analysis of the influence of the indicators both on the allocated resources and on the expected results.

The duration of execution of an objective is the one in which most of the value of the investment is consumed, which makes its phasing directly influenced by the immobilization of funds. Therefore, the company in question will choose the second project variant as the most advantageous, regarding its intention to invest.

5. Conclusions

Investments, by their nature, aim to boost economic growth and develop social-cultural activities. Investments take place over time, often over a long period, so that the recovery of the money spent becomes an uncertainty, the assumed risk increasing as the reference time is longer. For an economy in full reconstruction, as is the case of our country, the risk related to investments is a particularly interesting topic and still not discussed enough.

The topicality of this theme is also accentuated by the fact that, in the future, the investment process in our country will increase, so that the Romanian economy can face the economic crisis that is manifesting itself.

Direct investments and their efficient exploitation represent the only solution for the internal and external supply of goods and services, in other words a real economic growth.

The rigorous substantiation of investment decisions through the present paper represents a necessary and useful theoretical and applied approach, especially in the Romanian context of the development of the market economy and its convergence with the European economy.

The present work wants to highlight the opportunity of making an investment in a wood processing factory, namely a diverse furniture factory, having 2 work options available. In the study carried out, the technical-economic indicators of the investment are calculated and analyzed for each option separately, so that at the end of the study, the decision to finance only one option, namely the second option, is taken.

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