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Full Length Research Paper

The evaluation of economic investments projects in intensive breed of game: A study case for European deer (*Cervus elaphus* L.) and wild boar (*Sus scrofa* L.) in the context of the best investment decision

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The investments growth in the field of agriculture, hunting and fishery represents a condition of its technical and technological modernization, and finally, one of the conditions of economic stability of total economy. This research-applicable activity evaluates, on scientific basis, the effectiveness of the investment project, which refers to the intensive breed of the European deer (*Cervus elaphus* L.) and the wild boar (*Sus scrofa* L.) in fenced off part of hunting-ground "Mirosaljci-Strmovo" in the period 2009 - 2018. In the paperwork, a short description of a business idea is given, describing a statistical and dynamic approach on evaluation effects, which brings the investment project, as well as determination of the investments' safety level in terms of uncertainty. The results obtained during the research are focused on future strategic analyses in promoting hunting as a source for business financing.

Key words: European deer, economic effectiveness, investments, wild boar.

INTRODUCTION

In terms of activities in the field of agriculture, hunting and fishery based on pillars of open and competitive market, the investments should be realized in form to provide maximum exploitation effectiveness, that is, as high as possible, level of realized effects per a unit of invested financial resources. Bringing investment decisions must rely always on strict quantitative and qualitative regulation, which should provide precise direction of monetary outflow, that is, investments in the best (most effective) project variants. He, who does monetary outflow, in order to supply necessary production resources aiming to use them in long-term period, is called an investor (that can be any economic subject – legal entity or physical person – as well as a state itself). However, regardless of who an investor is, he must use adequate methods, techniques and models for evaluation of investments' economic effectiveness, due to assurance that his financial resources have been invested properly, to make the best results, as directly for the investor, as well as for the whole society.

As is well known, every investment project has as main objective, the gross value added, generated by combining and using all the necessary resources nearest to the optimal level of allocation. Taking into account that hunting offers not only a way for obtaining food but also a source for economic growth, we may appreciate that allocating money for investment project, having as purpose the hunting may represent a good way for economic potential capitalization.

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Fenced off hunting-ground “Mirosaljci-Strmovo” is located in the eastern part of mining strip of REIK “Kolubara”, mining “Mirosaljci” and “Strmovo”. In administrative sense, it belongs to the Lazarevac municipality and is located around 65 km south-west from Belgrade. In geographic sense, the hunting-ground of Lazarevac municipality stretches between 44° 16’ and 44° 34’ of north latitude and 22° 11’ and 22° 28’ of east longitude. The coordinates of the hunting-ground are:

North-south direction: 4,920,420-4,918,470;
East-west direction: 7,451,430-7,452,850.

The basic goal of fencing off the part of hunting-ground “Mirosaljci-Strmovo” is intensive breeding of European deer *(Cervus elaphus* L.) and wild boar *(Sus scrofa* L.). As it was established in the project, the main purpose for fencing off the part of the hunting-ground is to provide maximum number of healthy and trophy – oriented populations, along with constant control of breeders and application of scientific and professional achievements in the field of mentioned game breed. This will contribute to development of hunting tourism and this region's tourism development in general, along with the best integral use of revitalized land of REIK “Kolubara” mining. The goals of managing the hunting-ground have been determined as general and special. According to Cvijanovic et al. (2008), the general goals of managing the hunting-ground established for this investment project are:

a) Protection of hunting-ground and game;
b) Breed of stabile and healthy populations of European deer and wild boar;
c) Hunting and use of bred species of game and its parts in a way to provide existence of the game in quantity and quality, which allow natural conditions in the hunting-ground and which are planned by this project;
d) Protection of forests and agricultural cultures; and
e) Adjusting the management of the hunting-ground with other resources in the hunting-ground.

Managing the hunting-ground has been regulated by the law on hunting, other legal decisions and by work of employees and engaged workers in the hunting-ground but not in the last by the economic efficiency and effectiveness criteria. Adding to this t*he special goals* of managing the hunting-ground originate from *Special goals* of managing the hunting-ground and from peculiarities of the hunting-ground itself. Here can be counted among Cvijanovic et al. (2008):

i) Providing specific number and density, sex and age structure, as well as trophies quality of bred species of game;
ii) Improvement of habitat's natural conditions for bred species of game;
iii) Reclamation of 1,35 ha into pastures;
iv) Using the game and its parts through their usual hunt - through hunting tourism;
v) Game protection, especially rare species, if they show up in the hunting-ground;
vi) Registration of all important occurrences etc.

Rational use of the game as utmost goal of planned management of the hunting-ground

Considering technology of game breed, what precedes the utilization has already been known. Carrying out all measures that were predicted by this project, as well as planned documents that have to be made (Hunting base of the hunting-ground and Annual plan of managing the hunting-ground), the user of the hunting-ground through game hunt realized one of the measures in realizing goals of management and therefore realized some economic effects. This realization is through payment of game hunt and its part. The payment of the game is realized according to market price of the game and its part.

MATERIALS AND WORKING METHODS

The evaluation of economic effectiveness in intensive breed of European deer *(C. elaphus L.)* and wild boar *(S. scrofa L.)* in fenced off part of the hunting-ground “Mirosaljci-Strmovo“ (2009-2018) is based on statistical, dynamic and methods of investment projects' evaluation in terms of uncertainty.

Statistical evaluation of investments' economic efficiency

This is based on simple statistical methods, which are calculated by taking into consideration parameters only in one, average year of the project exploitation period. This method of effects evaluation which the project brings does not take into consideration total period in investment process and investments exploitation, but only a time section. Regarding that, in economic theory and practice, numerous statistical methods have been suggested, the accent will be put on calculations which have adequate theoretical background and verification in practical use. In that context, here was given a review of some basic statistical methods described in economic literature such as Gryglewicz et al. (2006), Cicea et al. (2008), Andric (1991) or Vanhuysse et al. (2002) and Subic (1999) for evaluating the investments' economic efficiency, respectively for estimating the productivity of production, production efficiency, accumulation of production; profitability of investments and pay-back time of investments (static approach).

Dynamic approach of effects evaluation

Dynamic approach of effects evaluation which brings the investment project encloses total period of investments and period of investment object's exploitation (Ohashi et al., 2009; Baker, 2003; SkonhoftA and Solstad, 1998). The methodological procedure in dynamic methods does not include average (annual), but all monetary outflows for acquisition and use of investment and all monetary inflow from investments for whole investment period. That is the evaluation of economic efficiency of investment gotten by comparison of the investments calculated amount with sum of net annual profit, realized by particular years of the investment exploitation. In calculative and methodological sense these methods are

Table 1. Total costs (in Euros).

Ordinal number	Description of cost	Years of project realization									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
I	Material costs	4.881,00	6.531,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00
1.	Material (supplies)	4.881,00	6.531,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00	6.551,00
II	Non-material costs	6.879,50	6.879,50	6.879,50	6.879,50	6.879,50	6.879,50	6.879,50	6.879,50	6.879,50	6.879,50
1.	Amortization	2.209,50	2.209,50	2.209,50	2.209,50	2.209,50	2.209,50	2.209,50	2.209,50	2.209,50	2.209,50
2.	Labour	4.170,00	4.170,00	4.170,00	4.170,00	4.170,00	4.170,00	4.170,00	4.170,00	4.170,00	4.170,00
3.	Services	500,00	500,00	500,00	500,00	500,00	500,00	500,00	500,00	500,00	500,00
Total (I+II)		11.760,5	13.410,5	13.430,5	13.430,5	13.430,5	13.430,5	13.430,5	13.430,5	13.430,5	13.430,5

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

methods are more complex, while their application is based on compound interest account, that is on application of financial mathematics according to Subić (2003), Done et al. (2009) or Vasilescu et al. (2010). Within the dynamic methods (Cicea et al., 2008; Romanu and Vasilescu, 1996), we indicate the methods which were the most processed in literature, and the most used in practice as: net present value, pay-back time of investments (dynamic approach) and the internal rate of return.

During evaluation of investment projects effects, the lack of possibility to anticipate future occurrences (incomes and expenses, period of exploitation etc.) significantly influences justification of investments and reduces real opportunities in making investment decision. Accordingly, during decision making, the investor stands in front of very complex task to, at least, reduce the risk of eventual worse decision.

Evaluation of investment projects in terms of uncertainty

The evaluation of investment projects in terms of uncertainty can be done by different methods and techniques. However, for needs of evaluation of investment projects in sector of agriculture (Cejvanovic et al., 2010), hunting and fishery, we believe that it is enough to review only lower profitability point. Before basic results of research are going to be described, there is going to be given economic-financial base in which are contained basic parameters of investment calculation (Tables 1 to 4). In period 2009-2010 (that is, in first two years of the project), both financial flow and economic flow were negative (Tables 3 and 4). However, in all other years of the project realization (in period 2011-2018), the financial flow is positive. So, therefore it can be determined that the investment project is solvent.

RESEARCH RESULTS AND DISCUSSION

Statistical evaluation of the project

In this section it was determined the main indicators for establishing the economic efficiency determinants like: production efficiency and productivity (the main estimated indicators in the economic literature for analyzing efficiency), accumulation of production, profitability of the investments made and not in the last, the pay-back time of the investment, using the statistical approach method. The statistical evaluation of investment project is based on parameters from just one, average year of exploitation period.

Production productivity

The production productivity (p) is mostly expressed as a relation between total income (i_t) and total number of workers (w):

$$p = \frac{i_t}{w} = \frac{28{,}519.65}{2} = €14{,}259.83 \quad (1)$$

According to upper calculation, realized income from sale per an engaged worker amounts is €14,259.83. In other words, the amount €14,259.83 represents surplus value (gross fect) per a unit of work, out of which the investor should cover interests and other different responsibilities, where residue amount represents the amount of profit (net effect) per a unit of work, i.e. per an engaged worker.

Production efficiency

The production efficiency is mostly expressed by *coefficient of efficiency (k),* which is calculated as relation between total income (i_t) and total expenses (e_t):

$$k = \frac{i_t}{e_t} = \frac{28{,}519.65}{11{,}052.00} = 2.58 \quad (2)$$

Table 2. Income sheet (in Euros).

Ordinal number	Description	Years of project realization									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
I	Total income	0.00	7,593.00	12,130.00	15,652.00	23,281.00	24,349.00	29,501.00	32,062.00	31,295.00	109,333.50
1.	Incomes by years	0.00	7,593.00	12,130.00	15,652.00	23,281,00	24,349,00	29,501.00	32,062.00	31,295.00	32,062.00
2.	Remaining value (value of game 2018)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77,271.50
II	Total expenses (1+ 2)	9,551.00	11,201.00	11,221.00	11,221.00	11,221.00	11,221,00	11,221.00	11,221.00	11,221.00	11,221.00
1.	Material costs	4,881.00	6,531.00	6,551.00	6,551.00	6,551.00	6,551,00	6,551.00	6,551.00	6,551.00	6,551.00
2.	Non-material costs without amortization	4,670.00	4,670.00	4,670.00	4,670.00	4,670.00	4,670,00	4,670.00	4,670.00	4,670.00	4,670.00
III	Gross income (I-II)	-9,551.00	-3,608.00	909.00	4,431.00	12,060.00	13,128,00	18,280.00	20,841.00	20,074.00	98,112.50
IV	Tax (10%)	-	-	90.90	443.10	1,206.00	1,312.80	1,828.00	2,084.10	2,007.40	9,811.25
V	Net income (III-IV)	-9,551.00	-3,608.00	818.10	3,987.90	10,854.00	11,815.20	16,452.00	18,756.90	18,066.60	88,301.25

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

Table 3. Financial flow (in Euros).

Ordinal number	Description	Starting year	Years of project realization									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
I	Total inflows (1+2+3)	111,881.09	0.00	7,593.00	12,130.00	15,652.00	23,281.00	24,349.00	29,501.00	32,062.00	31,295.00	184,442.09
1.	Total income	0.00	0.00	7,593.00	12,130.00	15,652.00	23,281.00	24,349.00	29,501.00	32,062.00	31,295.00	109,333.50
2.	Sources of funding	111,881.09										
3.	Remaining value of the project	0.00										75,108.59
	3.1. fixed capital	0.00										66,285.00
	3.2. working capital	0.00										8,823.59
II	Total expenses (4+5+6+7)	111,881.09	9,551.00	11,201.00	11,311.90	11,664.10	12,427.00	12,533.80	13,049.00	13,305.10	13,228.40	21,032.25
4.	Value of investment	111,881.09										
	4.1. in fixed capital	103,057.50										
	4.2. in working capital	8,823.59										
5.	Business expenses without amortization	0.00	9,551.00	11,201.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00
6.	Profit tax	0.00	0.00	0.00	90.90	443.10	1,206.00	1,312.80	1,828.00	2,084.10	2,007.40	9,811.25
7.	Liabilities to funding sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III	Net inflows (I-II)	0.00	-9,551.00	-3,608.00	818.10	3,987.90	10,854.00	11,815.20	16,452.00	18,756.90	18,066.60	163,409.84

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

Table 4. Economic flow (in Euros).

Ordinal number	Description	Starting year	Years of project realization									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
I	Total inflow (1+2)	0.00	0.00	7,593.00	12,130.00	15,652.00	23,281.00	24,349.00	29,501.00	32,062.00	31,295.00	184,442.09
1	Total income	0.00	0.00	7,593.00	12,130.00	15,652.00	23,281.00	24,349.00	29,501.00	32,062.00	31,295.00	109,333.50
2	Remaining value of the project	0.00										75,108.59
	2.1. Fixed capital	0.00										66,285.00
	2.2. Working capital	0.00										8,823.59
II	Total expenses (3+4+5)	111,881.09	9,551.00	11,201.00	11,311.90	11,664.10	12,427.00	12,533.80	13,049.00	13,305.10	13,228.40	21,032.25
3.	Investments	111,881.09										
	3.1. in fixed capital	103,057.50										
	3.2. in working capital	8,823.59										
4.	Business expenses (without amortization)	0.00	9,551.00	11,201.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00	11,221.00
5.	Profit tax	0.00	0.00	0.00	90.90	443.10	1,206.00	1,312.80	1,828.00	2,084.10	2,007.40	9,811.25
III	Net inflow (I-II)	-111,881.09	-9,551.00	-3,608.00	818.10	3,987.90	10,854.00	11,815.20	16,452.00	18,756.90	18,066.60	163,409.84

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

The coefficient of efficiency is higher than one (2.*58 >1*), which points out to a fact that total income is higher than total expenses. Accordingly, it can be concluded that the investment project is efficient (that is, the investment is payable).

Accumulation of production

The accumulation of production is mostly shown by *accumulation rate (a),* which is calculated as relation between profit *(P*) and total income *(i_t)*:

$$a = \frac{P}{i_t} = \frac{15,589.30}{28,519.65} \times 100.00 = 54.66 \quad (3)$$

The accumulation rate is higher than 7.00% (hypothetic weighted price of capital). Accordingly, it can be concluded that the investment project is accumulative (which means that, during the project exploitation, the price of funding sources has been covered and as a result "*a gain*" has been realized).

Profitability of investments

Defining profitability of investments as a relation between realized economic result from the investment and made investments, *the level of the investment's profitability* (*r*) is determined by calculating the rate of profitability as relation between profit (*P*) and pre-calculative investment value (*I*):

$$r = \frac{P}{I} = \frac{15,589.30}{111,881.09} \times 100.00 = 13.93 \quad (4)$$

The profitability rate is higher than 7.00% (hypothetic weighted price of capital). Accordingly, it can be concluded that the investment project is profitable (which means that, during the project exploitation, the price of funding sources has been covered and in that way "*a gain*" has been realized).

Pay-back time of the investment (statistical approach)

As statistical method for evaluation of the project effects, pay-back time (*T)* represents relation between pre-calculative investment value (*I*) and profit (*P*):

$$T = \frac{I}{P} = \frac{111,881.09}{15,589.30} = 7.18 \quad (5)$$

In accordance to above calculation, the investment

project will pay out for 7.18 years. Therefore, pay-back time of investments is 7 years and 2.16 months (*0.18 x 12 months*).

Dynamic evaluation of the project

In addition, a dynamic evaluation of the project was carried out for a better revealing of the project benefits. So it was computed as pointers like: net present value of the project, pay-back time of the investment in a dynamic manner and the internal rate of return.

Net present value of the project

According to the literature approach of Gittinger (1972), Markovits (2008), Romanu and Vasilescu (1996) and Andric et al. (2005), the *net present value* is the method in which all courses of income and expenses in anticipated investment and exploitation period of specific investment, discount to starting exploitation point, and then the amounts of expenses got in this way are deducted from the amounts of income, in order to get expected annual profits. As Bailey et al. (2000) sustain by definition of the NPV rule, managers should accept all projects with a net present value greater than zero because the distinction between real options and conventional decision-making arises in that the standard net present value rule does not take into account managerial flexibility over time. Opposite to this Madhani (2009) argues that net present value is not always a proper index in analyzing the investment project because it does not use the wait and-see strategy to make decisions.

But in our case as it is computed in Table 5 because it is taking into account a middle investment period of time about 10 years of use (the period of project realization) would provide to investor total increase of profit, calculated with discount rate (i = 0.07) on starting exploitation point (n = 0), in amount of €9,421.73. So in the main condition in computation this pointer is fulfilled.

Pay-back time of the investment (dynamic approach)

Continuing the research, it was also determined the pay-back time, this time using the dynamic approach for more relevance. Among statistical form, *pay-back time of the investment* can be transformed also to dynamic form if it uses discount technique. In that case, this method implies dynamic method of determining deadline for return of invested assets, that is, determining amortization period of investments, based on dynamic model of invest-ment calculation (or compound interest account). While in 2017 it should be residue investment €73,647.54, and net flow in 2018 year €83,069.28, it implies that for satisfaction of residue long-term investment is necessary: (|-73,647.54|:83,069.28) × 100.00 = 88.66% of cash flow from 2018. Therefore, we have the following pay-back time of the investment: T = 9.89 years, or 9 years and 10.68 months (0.89 × 12). The calculus is made in Table 6 (Subic et al., 2008).

Internal rate of return

Internal rate of return can be defined as interest rate where the sum of income from the investment, discounted in certain calculation moment is equal to the sum of expenses for secure and use of investment, discounted in the same calculation moment. Internal rate of return is the rate where net present value of the investment is equal to zero, and coefficient results-costs equals to one. For determining this, the classical Mathematical formulation for calculating internal rate of return (Botezatu, 2010; Ionita and Blidaru, 1996; Cicea et al., 2008) was used, respectively:

$$IRR = i_{min} + (i_{max} - i_{min}) \times \frac{NPV(+)}{NPV(+) + |NPV(-)|}, \qquad (6)$$

in which *IRR* represents internal rate of return, i_{min} is minimal discount rate, i_{max} is maximal discount rate, NPV *(+) the* net present value, adequate minimal discount rate and NPV *(-)* denotes the net present value, adequate maximal discount rate.

Internal profitability rate (IPR), as index of financial sources investments' economic effectiveness in the project, in regard to placement of those assets in the monetary market according to determined discount rate (*i=7.00%*), is got by bringing down $\sum NSV = 0$, which actually means:

$$IRR = 0.080 + (0.080 - 0.075) \times \frac{4,115.32}{4,115.32 + 943.07} = 0.0791 \qquad (7)$$

According to realized result (Table 7), it can be concluded that the internal profitability rate of the project is higher than hypothetic discount rate (IRR> i, or 7.91% > 7.00%).

Evaluation of the project in terms of uncertainty

Lower point of profitability

Lower point of profitability or *critical point* represents the level of production and sale where investment project does not realize neither profit nor losses, or, where it still realizes positive financial result (Vasiljevic, 2006; Vasiljevic et al., 2007). This point represents a borderline between profit and losses. Above the critical point, the investment project realizes the profit, while under this point are all losses. Calculation and application of lower profitability point (Table 8) is based on idea that shows and analyzes critical values of specific parameters, which are of crucial significance for total profitability of investment project. In other words, the main idea is to

Table 5. Net present value of the project (in euros).

Elements	Starting year	Years of project realization										Cumulative
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
0	1	2	3	4	5	6	7	8	9	10	11	12
Net inflow out of economic course (Columns 2 to 11)	-111,881.09	-9,551.00	-3,608.00	818.10	3,987.90	10,854.00	11,815.20	16,452.00	18,756.90	18,066.60	163,409.84	231,001.54
Discount rate	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	
Discount factor $(1+i)^{-n}$, where i = 0.07	1.0000000	0.9345794	0.8734387	0.8162979	0.7628952	0.7129862	0.6663422	0.6227497	0.5820091	0.5439337	0.5083493	
Net present value of inflow (column 1 to column 11)	-111,881.09	-8,926.17	-3,151.37	667.81	3,042.35	7,738.75	7,872.97	10,245.48	10,916.69	9,827.03	83,069.28	121,302.82
Net present value of the project (column 1 to column 11)	-111,881.09	-8,926.17	-3,151.37	667.81	3,042.35	7,738.75	7,872.97	10,245.48	10,916.69	9,827.03	83,069.28	9,421.73
Relative net present value (*9,421.73* : |*-111,881.09*|)	0.08 [in this case it means relative increase of accumulation above calculative price of total sources (7.00 %)], which means that during the project exploitation has been covered the price of funding sources and has been realized *„a gain"*]											

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

words, main idea is to calculate and analyze critical and minimal values of production size and incomes out of sale, under which the investment project is no longer justified, as well as to undertake all necessary measures to prevent it. "Turning point of profitability" shows critical and minimal values of production volume and income from sale, under which the investment project is not justified any more. Accordingly, it can be concluded that the investment is the most risky in fourth year of the project realization, when the production volume must not fall under *54.95%* (or, realized income must not be under *€8,600.51*). "Safety level" shows how much proportionally *(%)* can decrease sale (production) size in terms of profitable business, and in spite of all that, not to make a deficit. In that context, it can be concluded that the investment is the least risky in last year of the project realization, when the production volume decrease is allowed for *97.25%* (which means that the income from sale can be reduced for *€106,239.43*).

CONCLUSIONS

Summing up the results of the investment project's efficiency evaluation there can be drawn the following conclusions:

Static evaluation

i) The production productivity, i.e. realized income from sale per an engaged worker amounts *€14,259.83*;

Table 6. Pay-back time of the investment (in Euros).

Years of project realization	Net income of economic flow (present value of net income)	Cumulative net income
Starting year	0.00	-111,881.09
2009	-8,926.17	-120,807.26
2010	-3,151.37	-123,958.62
2011	667.81	-123,290.81
2012	3,042.35	-120,248.46
2013	7,738.75	-112,509.71
2014	7,872.97	-104,636.74
2015	10,245.48	-94,391.26
2016	10,916.69	-83,474.58
2017	9,827.03	-73,647.54
2018	83,069.28	

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

Table 7. Net present value of the project for selected discount rates (in Euros).

Ordinal number	Years of project realization	Net inflow from economic flow	NPV *(i=7.00%)*	NPV(+) *(i_{min}= 7.50%)*	NPV (-) *(i_{max}=8.00%)*
1.	Starting year	0.00	-111,881.09	-111,881.09	-111,881.09
2.	2009	-9,551.00	-8,926.17	-8,884.65	-8,843.52
3.	2010	-3,608.00	-3,151.37	-3,122.12	-3,093.28
4.	2011	818.10	667.81	658.54	649.43
5.	2012	3,987.90	3,042.35	2,986.14	2,931.23
6.	2013	10,854.00	7,738.75	7,560.45	7,387.05
7.	2014	11,815.20	7,872.97	7,655.79	7,445.58
8.	2015	16,452.00	10,245.48	9,916.52	9,599.58
9.	2016	18,756.90	10,916.69	10,517.04	10,133.77
10.	2017	18,066.60	9,827.03	9,423.24	9,037.80
11.	2018	163,409.84	83,069.28	79,285.46	75,690.37
Σ		231,001.54	9,421.73	4,115.32	-943.07

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

ii) The project has been economical during its realization, i.e. coefficient of efficiency has been higher than 1 (2.58 >1);
iii) The project was accumulative during its realization, i.e. the accumulation rate was higher than weighted price of capital (*54.66 > 7.00%*);
iv) The project was profitable during its realization, i.e. the level of the investment's profitability was higher than weighted price of capital (*13.39 > 7.00%*);
v) Pay-back time of the investments is *7* years and *2.16* months.

Dynamic evaluation

i) Net present value of the project is positive and it amounts to *€9,421.73*;
ii) The project was accumulative during its realization, i.e. relative net present value is higher than calculative price of total sources (*0.08 > 0.07*);
iii) The pay-back time of the investments is *9* years and *10.68* months,
iv) Internal rate of return is higher than discount rate (*7.91% > 7.00%*).

Evaluation in terms of uncertainty

i) The investment is the most risky in fourth year of the project realization, when the production size should not decrease under *54.95%*;
ii) The investment is the least risky in last year of the project realization, when decrease of production volume is allowed for *97.25%.*

Table 8. Lower profitability point (in Euros).

Ordinal number	Description	Years of the project realization									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
(1)	Total income from sold products	0.00	7,593.00	12,130.00	15.652,00	23.281,00	24.349,00	29.501,00	32.062,00	31.295,00	109.333,50
(2)	Variable costs: VC = material costs + labour	9,051.00	10,701.00	10,721.00	10,721.00	10,721.00	10,721.00	10,721.00	10,721.00	10,721.00	10,721.00
(3)	Fixed costs: FC = non-material costs - labour	2,709.50	2,709.50	2,709.50	2,709.50	2,709.50	2,709.50	2,709.50	2,709.50	2,709.50	2,709.50
(4)	Marginal result: (1) - (2)	-9,051.00	-3,108.00	1,409.00	4,931.00	12,560.00	13,628.00	18,780.00	21,341.00	20,574.00	98,612.50
(5)	Turning point of profitability: (3) : (4) × 100	-29.94	-87.18	192.30	54.95	21.57	19.88	14.43	12.70	13.17	2.75
(6)	Turning point in value (1) × (5) : 100	0.00	-6,619.44	23,325.93	8,600.51	5,022.28	4,841.03	4,256.28	4,070.66	4,121.41	3,004.07
(7)	Safety level: [(1) - (6)] : (1) × 100 shows how much percentages (%) can fall the sale (production) size (1) in terms of profitability business and not to make a deficit	0.00	187.18	-92.30	45.05	78.43	80.12	85.57	87.30	86.83	97.25

Source: Own calculation based on field data and using the work of Cvijanovic et al. (2008).

In accordance to the above mentioned conclusions, it could be concluded that the investment project was economically-financially justified and also it was put in to work and financed by the Serbian authorities.

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