

THE COMBINATION SELECTION OF THE MOST ADEQUATE DEVELOPMENT PROJECTS IN A CONSTRAINT BUDGET INVESTMENT

IZBOR KOMBINACIJE NAJPRIHVATLJIVIJIH RAZVOJNIH PROJEKATA BUDŽETSKIM OGRANIČENJEM ULAGANJA

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Abstract: *The Republic of Croatia invests a great effort to approach the standards of The European Union in the last few years using the financial assets of the precession funds. Although the constraint financial assets allocated for development projects in a strictly defined area are fully accessible The Republic of Croatia did not use the opportunity to recruit the available resources. The reasons to this situation are numerous in their complexity. This paper does not analyse them. The first criterion in the project selection presented in this paper is the fulfilment of this criterion. The authors suggest net present value method (NPV) and index of profitability as a method to rank the projects competing in a constraint budget investment.*

Key words: *development project, net present value method (NPV), index of profitability, constraint budget investment*

Sažetak: *Republika Hrvatska već niz godina ulaže napore da se što kvalitetnije približi standardima Europske unije koristeći i financijska sredstva pretpristupnih fondova. Iako je riječ o ograničenim financijskim sredstvima, koja se dodjeljuju za razvojne projekte uz definirane kriterije, Republika Hrvatska nije iskoristila sve mogućnosti da bi privukla sva dostupna sredstva. Razloga je više. U radu autori ne analiziraju složenost razloga zbog kojih sva ponuđena sredstva nisu iskorištena. Uz uvjet da su svi kriteriji u razvojnim projektima zadovoljeni, autori nude prijedlog kako iskoristiti metodu neto sadašnje vrijednosti i indeks profitabilnosti kod rangiranja projekata koji se natječu za ograničena sredstva.*

Ključne riječi: *razvojni projekt, NPV, indeks profitabilnosti, ograničeni budžet*



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1. Introduction

The results achieved by The Republic of Croatia in its efforts to approach the standards of The European Union in the last few years can be regarded as an overture to future progress and results acquirement at economy and social level. A great contribution to the shift in these efforts is due to assets gained from EU preaccession funds. The progress and statistical data reports show that anticipated financial assets are not fully utilised due to several reasons which cannot be analysed and presented as a part of this paper. Nevertheless all European Union (EU) precession funds have limited financial assets scheduled for implementation to candidate and potential candidate countries in their harmonization and implementation of Acquis communautaire as well as reliance of Structural funds (Central State Office for a developmental strategy and coordination of EU precession, 2008.). The challenge to the Republic of Croatia and its regions is to find a place in those circumstances and utilise potential chances. The main issue of this paper is a criterion that extracts a project at financial assets allocation tender. The financing programs strictly specify all criteria necessary for project application and acceptance. This paper evaluates solely criterion fulfilling projects. The selection of top development projects is based on their future financial results materialization capability. The paper aims to investment return criterion omitting the other criteria, regarding the fact that their appearance does not influence the research results. The background prepared to rank our projects is the results gained by a net present value method and index of profitability.

2. The evaluation of development projects

The intention of this paper is to show a mode, for development projects applied for financial funds allocation tenders, to determine in advance the applied projects quality and rank in accordance to it, in notion to avoid unforeseen negative bounds from EU precession funds. To achieve this goal we can use method of planning a long – term project funding: net present value method (NPV) and index of profitability in the circumstances of a constraint budget investment. The constraint budget investment solves a problem of the most eligible project combination variety granting the highest total NPV. Index of profitability is mostly used to rank projects competing in a constraint assets area. (Shim & Sigel, 2007). The selected sample analysis presented in this paper elaborates development projects competing for the assignation of financial assets in a frame of EU precession fund, aimed to candidate countries for agriculture and rural development. Our analysis is based on nine development projects using the above mentioned methods determining and recommending the top cost – effective projects.

2.1. Present value calculation of the future net receipt by a net present value method
Net present value (NVP) is a difference of present value of the future net receipt produced by a project above the amount of initial investment. The difference obtained

shows total financial result (profit or loss) to be accomplished during the usage time (Karić, 2005.). If $NVP > 0$ the project is acceptable. (Vidučić, 2001).

$$NPV = \sum_{t=1}^n \frac{NV_t}{(1+k)^t} - I_0 \quad \text{or} \quad NPV = PV - I \quad (1)$$

The present value of the future net receipt, PV is calculated by the usage of so called cost of capital (or minimal rate of return) as a discount rate. (Shim & Sigel, 2007). According to that k is required rate investitures return calculated on the bases of former business activity or it presents a rate realised by an investor as a result of another investment, and in the presented development projects amounts 12%. The last net receipt expected period is marked n . The economic operator investment proposed to EU precession fund financial assets allocation tender (initial investment) is marked I . In a condition when expected year net receipts are equal most authors recommend the usage of the next equation:

$$NPV = NV \times \frac{k^n - 1}{k + (1+k)^n} - I_0 \quad \text{or} \quad NPV = NV \times PVIFA - I \quad (2)$$

The same equation is also most recommended in a condition of different annual net receipts alongside calculation average annual net receipts. The appliance of this equation simplifies the NPV calculation, but the result is not perfectly accurate.

$$NPV = \frac{\sum NV}{n} \times \frac{k^n - 1}{k + (1+k)^n} - I_0 \quad (3)$$

This paper presents a nine development project NPV calculation based on both equations.

2.2. Ranking development projects to index of profitability

The expected annual net receipts by a separate development project are presented in Table 1. Our aim is to determine 1) the extent of influence in appliance of individual equation to the result in development project efficacy analysis, 2) determine a development project acceptability, 3) make a nine development project ranking in accordance to the values of index of profitability and 4) to make a selection of development projects to be financed in the circumstances of a constraint budget investment.

$$\text{Index of profitability} = PV/I \quad (4)$$

The project is acceptable if $PV/I > 1$, because then $NPV > 0$

This paper presents the financing of development projects in the constraint budget investment of 2.000.000,00 €. The total amount of the initial investment of applied development projects to the financial assets tender sums up to 4.474.800,00 €.

Project B: Watering system construction														
I	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	Σ NV	PV
0	55000	55000	55000	55000	55000	55000	55000	55000	55000	55000	55000	55000	660000	340696,88
Project D: Cooling and fish product packaging equipment procurement														
I	1.	2.	3.	4.	5.	6.	7.	8.	Σ NV	PV				
0	70000	72000	74000	76000	78000	80000	82000	84000	616000	376686,51				
359500														
Project E: Dairy adaptation and modernization														
I	1.	2.	3.	4.	5.	6.	7.	8.	Σ NV	PV				
0	80000	78000	76000	74000	72000	70000	68000	66000	584000	368476,54				
422000														
Project F: Vegetables drier adaptation														
I	1.	2.	3.	4.	5.	6.	7.	8.	Σ NV	PV				
0	40000	45000	48000	50000	80000	80000	80000	80000	503000	291961,47				
576900														
Project G: Shamble adaptation														
I	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	Σ NV	PV		
0	173000	173000	173000	173000	173000	173000	173000	173000	100000	100000	1584000	927679,93		
784000														
Project H: Fish refinement shed construction and equipage														
I	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	Σ NV	PV		
0	125000	130000	142000	150000	160000	160000	160000	160000	160000	180000	1527000	836160,7		
792000														
Project I: Fruit and vegetables shed construction and equipage														
I	1.	2.	3.	4.	5.	6.	7.	8.	9.	Σ NV	PV			
0	170000	180000	190000	200000	210000	220000	230000	240000	250000	1890000	1079388,71			
847000														

Table 1. Expected development projects annual net receipts in €

Table 2. NPV calculation and index of profitability development project ranking

3. Conclusion

In the present value of the future net receipt calculations of a particular development project in appliance of the equations mentioned above the results obtained are perceivably different. They influence to a difference in NPV of the project else in cases of annual net receipt annually alike. The obtained results are an absolute value. Regarding the criteria $NPV > 0$, in the process of project selection, the differences in the obtained results do not influence a decision making process. Project A, B, D, G, H and I are eligible. Index of profitability presents a relative value rationalising the decision making process about the particular development project efficacy. This method also supports project A, B, D, G, H and I as acceptable. The variations in indexes of return calculated at the ground of differences in the previous results did not influence to the development project ranking process:

Rank	Project	I	PV (1)	PV (2)
		€	€	€
1	B	217000,00	340696,88	340692,00
2	I	847000,00	1079388,71	1118922,00
3	A	128400,00	161587,27	163286,75
4	G	784000,00	927679,93	894991,68
	Total 1-4:	1976400,00	2509352,79	2517892,43

Table 3. Index of profitability ranking of development projects

In the circumstances of a constraint budget investment of development projects up to 2.000.000,00 €, the index of profitability ranking of development project nominate A, B, G and I as the top ones. The total sum of initial investment accepted development project is 1.976.400,00 €, and all NPV accepted project is 532.952,79 € (2.509.352,79 € – 1.976.400,00 €).

4. References

- Helfert, E.A. (1997). *Tehnike financijske analize*, VII. izdanje, Računovodstvo i financije, Zagreb, ISBN 953-6480-12-3
- Hrvatska gospodarska komora, Euro info komunikacijski centar Zagreb (2008). SAPARD, Available at: http://www.euroinfo.hr/index.php?page=category&cat_id=61 Accessed: 05-25-2008
- Karić, M. (2005). *Ekonomika poduzeća*, II. izdanje, Ekonomski fakultet u Osijeku, Osijek, ISBN 953-6073-60-9
- Shim, J.K. & Sigel, J.G. (2007). *Upravljačke financije*, Zgombić i partneri d.o.o., Zagreb, ISBN 978-953-6348-28-2
- Središnji državni ured za razvojnu strategiju i koordinaciju fondova Europske unije (2008). Instrument pretpristupne pomoći IPA, Available at: <http://www.strategija.hr/Default.aspx?sec=34> Accessed : 05-25-2008
- Ured za udruge vlade Republike Hrvatske (2008). IPA, Available at: <http://www.uzuvrh.hr/stranica.aspx?pageID=24> Accessed: 05-25-2008
- Vidučić Lj. (2001). *Financijski management*, RRIF, Zagreb, ISBN 953-6121-55-7