5. konferenca DAES

Sodobni izzivi menedžmenta v agroživilstvu

Pivola
18.-19. marec 2010

društvo agrarnih ekonomistov slovenije
DAES

Sodobni izzivi menedžmenta v agroživilstvu

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Tisk:
Potens d.o.o.

1. izdaja
Naklada 250 izvodov
Domžale, 2010

Prispevki so recenzirani. Za jezikovno pravilnost in vsebino odgovarjajo avtorji.

CIP - Kataložni zapis o publikaciji
Narodna in univerzitetna knjižnica, Ljubljana

338.43(497.4)(082)
338.43(497-15)(082)
63:339.923:061.1EU(082)

DRUŠTVO agrarnih ekonomistov Slovenije. Konferenca (5 ; 2010 ; Maribor)
Sodobni izzivi menedžmenta v agroživilstvu / 5. konferenca DAES, Pivola, 18.-19. marec 2010 ; [uredil Črtomir Rozman in Stane Kavčič].
- 1. izd. - Ljubljana : Društvo agrarnih ekonomistov Slovenije - DAES, 2010

ISBN 978-961-91094-5-8
1. Gl. stv. nasl.
250170112

III. Modeli za poslovno analizo

društvo agrarnih ekonomistov slovenije
DAES

5. konferenca DAES »Sodobni izzivi menedžmenta v agroživilstvu«.
Pivola, 18.-19. mar. 2010, s. 197-204.

ASSESSMENTS AND APPLICATION OF BASIC FINANCIAL INDICATORS IN FRUIT PRODUCTION

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ABSTRACT

This paper's aim is to evaluate importance of the basic financial indicators and its influence on the standardized project's grade. The research was conducted using survey questionnaires to a sample of 14 experts in the field of microeconomics, who evaluated an importance of economic indicators in agriculture. Using Likert's scale, they assessed importance of operating profit value, cost/income ratio, productivity and profitability indicators. Their grades were converted to utility coefficient (indicator's priority) for the purpose of the group decision making in selecting fruit production. Analyzed fruit species achieved different financial indicator value. Based on indicator's priority they were turned in normalized utility grade which enables fruit species ranking.

Key words: financial indicator, utility, fruit production

OCENA IN APLIKACIJA OSNOVNIH FINANČNIH INDIKATORJEV PRI PRIDELAVI SADJA

IZVLEČEK

Namen prispevka je ocena pomembnosti nekaterih osnovnih finančnih indikatorjev in njihov vpliv na standardizirano oceno kmetijskega projekta – pridelave sadja. V raziskavo je bil vključen predhodno pripravljen anketni vprašalnik za 14 ekspertov s področja mikroekonomike, kateri so ocenjevali pomembnost ekonomskih indikatorjev v kmetijstvu. Za oceno dobička, razmerja prihodki/stroški, indikatorjev produktivnosti in profitabilnosti je bila uporabljena Likartova skala. Ocene, pridobljene na osnovi Likartove skale, so bile pretvorjene v koeficiente koristnosti (t.i. indikatorje pomembnosti). Koeficienti koristnosti med drugim omogočajo tudi samo podporo v odločitvenemu procesu. Rezultati raziskave kažejo, da analizirane sadne vrste dosegajo različne vrednosti finančnih indikatorjev in s tem posledično tudi različne koeficiente funkcije koristnosti.

Ključne besede: finančni indikatorji, koristnost, pridelava sadja

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1 Introduction

For the purpose of business success in as much as possible higher level, each investment project should be managed with the basic economic principle of reproduction, which is in fact the basic principle of rationalization: to achieve the highest score with the smallest related costs.

In order to asses the fulfillment of this principle one need to quantify business project i.e. to express its performance with nominal and relative business results indicators. The various measures calculated for a whole project analysis are part of control function of management. As such, they should be used to identify and isolate a problem before it has a serious negative impact on the business (Kay, Edwards, 1999).

In Strategy of Croatian Agriculture Development (Žimbrek et al, 2001), the fruit growing is recognized as one of the most significant items respects Croatian agriclimate and demographic structure. In accordance with the Croatian program of perennial cultures establishment, the fruit production is one of the most fast-growing agricultural activity since 2004, when this program started. Therefore, it is of great importance to use all available agroeconomic methods to avoid mistakes which could cause the long-term undesirable consequences.

Business Performance Analysis is particularly important in a case of long-term projects as fruit production is. The wrong choice of the fruit species production later is difficult to correct - high opportunity costs are inevitable. In this paper four fruit species that can be grown in the similar agriclimat condition has been analyzed. However, apple, pear, peach and plum as one of the most important agricultural crops in Croatia, results with different economic indices which are compared and ranked based on the main measurement's weights.

2 Material and methods

2.1 Business performance measure

There are many standard measures of business performance evaluation of the project, corporation or other business unit. Most of sources list four measures - *Liquidity ratios* which analyze the capability of cash to pay debt, *Activity ratios* measure a project's ability to convert different assets into cash or sales, *Debt ratios* measure the firm's ability to repay long-term debt, *Profitability measures* look at how much profit the firm generates from sales or from its capital assets. All this indicators use financial evidence as an information base. Due to scarce and not very detailed financial statement on average family farm in Croatia, it is impossible to calculate reliably enough all maintained indicators. Therefore, business analysis of these households might be conducted based on simpler level.

Jelavić (1995) stated three simple relative business indicators - *Cost/Income Ratio*, *Productivity Coefficient* and *Profitability Indicators.*

Cost/income ratio - expresses a project's cost effectiveness which sets operating expenses in relation to operating income. Lower value indicates more rational project in money terms.

Productivity Coefficient – shows labor efficiency as a production value divided by quantity of human labor. Higher value is more acceptable.

Profitability rate – indicates efficiency of the project's capital employed. It is calculated as net profit divided by invested capital. A larger rate indicates better performance.

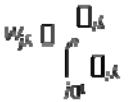
This paper attached to them fourth – *Operative Profit* value. This is not relative but single indicator represented as a difference between operative income and operative cost.

Using all maintained measures, one by one, different project estimation can be generated. Some project can be acceptable according to cost/income ratio but with insufficient operative profit value concurrently. In this paper authors tried to find a way of indicators combination in order to obtain a single project's evaluation mark. Aggregation rule is based on the indicators' relative importance (weights) estimation according to group opinions of fourteen microeconomics experts.

Indicator weights were used in an economic analysis of different fruit species growing results. Because of the economy of scarcity, fruit-growing investors have to distribute their finances in best way considering market, risk and economic features of different fruit species. An aim of economic analysis is to compare and rank all business possibilities using available sources. In this paper, business indicators values were determined based on data from *Catalog of Agricultural Products Calculations* (HZPSS, 2004), updated by the actual figures. For the comparability purpose, these measures were standardized and combined by weights in single business performance appraisal. In that way, comparing economic analysis of apple, pear, peach and blackberry production was conducted.

2.2 Group indicator ranking

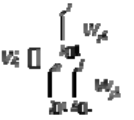
Due to the fact that there is not exact data and estimation about individual measure importance, there are different opinions, which of indices are more or less preferred. For the purpose of financial indices evaluation, group of experts in the field of micro(agro)economic has been consulted. Survey questionnaires were sent via e-mail addresses of 68 experts, who were selected according to their professional vacation from the agricultural advisory service, faculties and senior schools of Agriculture and Economics in Croatia and the countries of the Region. Of 68 queries, the answer has been returned by them 14. In questionnaire, experts were asked, using the Likert scale, to rate each of four financial indicators. There was a note that appraisement should be done with the respect of specificity of agricultural production. Likert's scale is defined in interval from 1 to 10. Grade 1 is intended to "completely irrelevant indicator" when the score estimated 10 presents "extremely important indicator." Based on this assessment the group calculated the weight of individual indicator (criteria) business success. The first step was to determine partial indicator weight based on the individual appraisal by next formula:



Where,

w_{jk} *– weight of j-indicator based on the k- evaluator judgment*
p_{jk} *– k-evaluator judgment for the j-indicator*

When all individual judgments were collected, the group indicator weight was determined by the formula:



where,

w_j – weight of j-indicator based on the group judgment

Weights w_j and w_{jk} are normalized, i.e. all weight sum equal 1.

3 Results

There were fourteen experts who responded to the request to estimate importance of four business indicators. Their appraisal is listed in the next table:

Table 1: Expert's (A- N) appraisal for business indicator importance *(1-totally irrelevant indicator, 10 – totally relevant indicator)*

INDICATOR		Operative net profit	Cost/income ratio	Profitability	Productivity	
EXPERTS	A	9	7	7	8	31
	B	8	10	10	9	37
	C	10	8	7	7	32
	D	6	8	6	9	29
	E	10	7	7	7	31
	F	5	8	10	8	31
	G	9	9	10	8	38
	H	8	5	10	5	28
	I	5	5	5	2	17
	J	10	10	8	10	38
	K	7	10	10	10	37
	L	8	8	10	7	33
	M	7	3	10	7	27
	N	5	7	9	7	28

Source: Questionnaire

For the purpose of comparability, these estimations were normalized in form of relative importance weights which sum equals 1.

Table 2: Normalized weights of business indicator

INDICATOR		Operative net profit	Cost/income ratio	Profitability	Productivity
EXPERTS	A	9/31	7/31	7/31	8/31
	B	8/37	10/37	10/37	9/37
	C	10/32	8/32	7/32	7/32
	D	6/29	8/29	6/29	9/29
	E	10/31	7/31	7/31	7/31
	F	5/31	8/31	10/31	8/31
	G	9/38	9/38	10/38	8/38
	H	8/28	5/28	10/28	5/28
	I	5/17	5/17	5/17	2/17
	J	10/38	10/38	8/38	10/38
	K	7/37	10/37	10/37	10/37
	L	8/33	8/33	10/33	7/33
	M	7/27	3/27	10/27	7/27
	N	5/28	7/28	9/28	7/28
		3,46	3,35	3,86	3,33
		0,2471	0,2392	0,2757	0,2378

Source: Authors according questionnaire results

The study results show that respondents believe that the most important business performance indicator is profitability (ratio of profit and the total investment). Followed by the operating profit (EBITDA), as difference between total operating revenues and total operating costs. Third place holds cost/income ratio while productivity is estimated as the least important factor. According to that one can generate next business success utility coefficient (UC).

UC= 0,247 operative net profit + 0,239 C/I Ratio + 0,275 Profitability rate + 0,238 Productivity factor

Business results of fruit species production based on 1 ha area were taken from the Catalog of Agricultural Products Calculations (HZPSS, 2004) and Krpina (2004). Using the relative measures authors eliminated the price changes since 2004.

Table 3: Business performance in fruit production – nominal value

	Operative net profit, HRK	Cost/income ratio	Profitability rate, %	Productivity, HRK/h
Apple	42.229	0,568	28,3	56,0
Pear	40.468	0,502	27,0	62,3
Peach	34.329	0,503	33,3	49,8
Plum	17.384	0,551	23,6	43,5

Source: Authors calculation based on HZPSS, 2004; Krpina 2004

Indicators in table 3 are presented in different and incomparable units. The apple production results are superior when operative net profit is considered but inferior in respect to other measures. Peach production has the best performance due to profitability rate, but it is weaker in operative net profit and productivity measure. This way, it is difficult to choose the best fruit production option because there is not one dominant solution for all analyzed criteria. That is why, standardization and normalization by indicators weights is required. Standardization for adjustment of specie's relative indicator value is made as a ratio of indicator' value for certain fruit species and sum of indicator's value of all species.

Table 4: Business performance in fruit production – relative value

	Operative net profit, HRK	Cost/income ratio	Profitability rate, %	Productivity, HRK/h
Σ	134.410	2,123	112,2	211,5
Apple	0,314	0,267	0,252	0,265
Pear	0,301	0,236	0,240	0,294
Peach	0,255	0,237	0,297	0,235
Plum	0,129	0,260	0,210	0,205
Σ	1	1	1	1

Source: Authors calculation based on table 3

Finally, indicators weights are multiply by respective specie's relative value what generated single appraisal for each fruit production. Final fruit appraisal is calculated summing these pondered values. The most acceptable production option is apple production, as one with the highest utility coefficient, while plum production is the worst solution.

Table 5: Final appraisal for different fruit production

	Operative net profit	Cost/income ratio	Profitability rate	Productivity	FINAL APPRAISAL
Apple	0,078	0,064	0,069	0,063	0,274
Pear	0,074	0,056	0,066	0,070	0,267
Peach	0,063	0,057	0,082	0,056	0,257
Plum	0,032	0,062	0,058	0,049	0,201

Source: Authors' calculation

However, small differences between fruit species results suggest that it would be useful to include other business parameters in analysis i.e. price and yields standard deviation. Nevertheless, for the final decision on fruit production more information is needed. Market condition, detailed agriclimat and soil adequacy analysis, labor and technology availability are just some relevant criteria that should be under the severe consideration before investment decision. For that purpose more sophisticated tools might be used.

4 Conclusion

This paper presents the basic appliance of the group decision-making and economic measures in synthesized fruit production success grade. The paper applies utility approach where utility coefficient quantifies the satisfying level of a different business performance indicator. The aim of this study was to apply these concepts in ranking fruit species production.

Application of economic indicators is a simple tool that helps in situation of business decision making and achieving a safer production orientation. Survey questionnaires filled out by 14 experts in the field of microeconomics led to the conclusion that the profitability is the most important business indicator. Second in importance is the operating profit as the difference between revenues and expenses. Finally, the experts considered less important cost/income ratio and productivity measure.

Evaluated importance of economic indicators expressed as measures' weights was applied in ranking fruit production. The results indicate that an apple growing shows the highest utility value when economic criteria have been combined. Apple is determined as the best production selection despite the fact that it achieved superior performance only accordance to the net profit criteria but inferior to all other three indicates. The pear production is the second best option, which generates the best productivity measure value. Peach offers the most profitable production but insufficient due to other used measure. The most undesirable option is plum production, inferior to all used criteria.

This paper does not pretend that an economic grade should be the only guide for the production choosing. It is unavoidable in final decision to include all other non-economic crop features as the soil suitability, humidity requirements, labor and technology complexity. However, economic performance measures with utility criteria

applied can be used as one important fragment in complex business decision making of fruit production selection.

5 References

European commission, 2006. Agricultural Insurance Schemes, Final report, Fact Sheet Croatia, available at http://ec.europa.eu/agriculture/analysis/external/insurance/annex27_en.pdf.

Hrvatski zavod za poljoprivrednu savjetodavnu službu (2004). Katalog kalkulacija poljoprivredne proizvodnje, (Catalog of Agricultural Products Calculations), HZPSS, Zagreb, p. 186.

Jelavić, A., Ravlić, P., Starčević, A., Šamanović, J., 1995. Ekonomika poduzeća, Ekonomski fakultet Zagreb, p. 274.

Kay R.D., Edwards, W.M., 1999. Farm Management, 4th edition, McGraw-Hill Companies, USA, p. 305.

Krpina I. 2004. Voćarstvo, Globus, Zagreb, p. 145.

Žimbrek, T. i sur. 2001. Strategija razvitka hrvatske poljoprivrede, u Strategija razvitka Republike Hrvatske »Hrvatska u 21. stoljeću«, odjel »Prehrana«. Vlada Republike Hrvatske, p. 234-289.

Izvedbo konference so podprli:

Univerza v Mariboru
Fakulteta za kmetijstvo in biosistemske vede

društvo agrarnih ekonomistov slovenije
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